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THE UNIVERSITY OF ALBERTA
STAFFING RATIOS AND COSTS IN METROPOLITAN SCHOOL
SYSTEMS IN WESTERN CANADA

by



WILLIAM LEPATSKI

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "Staffing Ratios and Costs in Metropolitan School Systems in Western Canada," submitted by William Lepatski in partial fulfilment of the requirements for the degree of Master of Education.

Date *September 30, 1970* . . .

ABSTRACT

This study attempted to describe the relationships between the size of twenty-one school systems in three major metropolitan areas of Western Canada and (1) the size, and (2) the cost of the administrative, central office, support, non-instructional, and instructional components during the 1969-70 school year. This investigation also attempted to compare staffing ratios and costs of groups of school systems in metropolitan Vancouver and metropolitan Winnipeg. These main problems were divided into twenty-three subproblems.

The superintendent of each school system was asked to supply information pertaining to the numbers of personnel in each component specified and their total gross salaries. Follow-up letters and personal interviews were also employed to ensure proper interpretation of the questionnaire.

Pearson product moment correlations between the percentages of staff in various components and the total staff, the total number of schools and the total number of pupils in a system, indicated that (1) significant negative correlations existed between the percentage of staff in administrative positions and each measure of system size; (2) significant positive correlations existed between the percentage of staff in support positions and each measure of system size; (3) significant positive correlations existed between the percentage of staff in non-instructional positions and each measure of system size; and, (4) positive, but insignificant correlations existed

between the percentage of staff in central office positions and each measure of system size. Correlations were considered significant if they were equal to, or greater than $|\cdot40|$.

In order to compare the numbers of personnel in, and cost of various components among the small and large school systems, the twenty-one systems were categorized into four groups based on the number of pupils in each. Inspection of the mean ratios for each group revealed the following: (1) mean administrative ratios were lower for groups comprised of small school systems than for groups containing large systems; (2) mean central office ratios showed a tendency to be larger for groups containing larger systems; (3) mean support and mean non-instructional ratios were progressively larger for groups composed of larger systems; (4) mean instructional ratios were always lowest for the very large systems; (5) lower mean per pupil administrative costs were associated with groups of larger school systems, however, the per pupil costs were again larger for the group containing two very large systems; (6) a general tendency for higher mean central office costs to be associated with groups of larger systems was evident; (7) mean support and mean non-instructional costs were successively larger for groups comprised of larger school systems; and (8) mean instructional costs were lowest for small systems and highest for very large systems.

Similar results to those above were obtained for the salary indices of each component and for the mean numbers of personnel in, and mean cost of, groups of school systems in the metropolitan areas of Vancouver and Winnipeg.

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Chapter 1

THE PROBLEM AND DEFINITION OF TERMS

Morphet, Johns and Reller (1959:8) write:

In any society the establishment of an educational program calls for a plan and an organization for carrying out the program. In primitive groups the organization was usually relatively simple, but as society became more complex and schools were developed the need for an appropriate organization to carry out the purposes of education had to be developed.

The type of organization that has proven "appropriate" for the implementation of existing educational plans and programs has been a modification of Weber's polar model of bureaucracy. Lane, Corwin and Monahan (1967:83) write that bureaucracy, as a concept, refers to organizing principles that are intended to improve administrative efficiency; as a method, it consists of essentially two principles, specialization and coordination. Specialization, the process of breaking work down into standard components, is accomplished in Weber's bureaucratic model, through "a hierarchy of offices which establish spheres of delegated responsibility," that is, division of labor. Lane *et al.* (1967:184) further state that according to Weber, coordination of work should occur in central offices which are responsible for re-integrating specialized activities into a consistent whole. Furthermore, as specialization increases, the amount of required coordination increases and the staff in the central office grows.

Teacher specialization and growth of educational systems, as measured in numbers of schools, teachers, and pupils, is readily

apparent on the current education scene. These changes have directly affected the coordination of activities and have forced the increases predicted by Weber in the size of central offices. Blau and Scott (1962:7), and Gill and Friesen (1968:1), support the latter when they point out that as organizations grow they require an increasingly elaborate administrative apparatus. Campbell, Corbally, and Ramseyer (1966:85) agree when they identify the increased number of tasks of central office personnel which accompany such organizational growth.

The general trend towards increasing the size and complexity of the administrative structure as precipitated by the growth of large organizations, has generated definite but often opposing views regarding its efficiency. Indik (1965:7) feels that as groups grow larger, intra-group relationships multiply and complexity of tasks increases; therefore, increased supervision becomes necessary. Griffiths *et al.* (1962:189) state that the increase in size of school systems has been paralleled by a rapid growth of knowledge in all subject areas taught in school and by the American philosophy that each child should be provided the opportunity to be educated to his potential. These trends, the authors feel, make the educational organization more complex and hence, require more specialists. Parkinson, by obtaining statistics on situations that occurred in the British Navy and British Colonial Office, suggested that as the production functions of an organization decrease, a large number of indirect tasks are created and cause increases in administrative staff (1957:15-22). Terrien and Mills (1955:13) observed in their study of California school systems that increases in school organization size were accompanied by increases in the proportion of personnel in administrative positions.

Other researchers disagree with the above findings. Gill and Friesen (1968:4) concluded that, "As school systems increase in size the proportion of staff in the administrative component declines." Both Blowers (1969:156) and Vithayathil (1969:106) found in their studies of administrative ratios in various Western Canadian school systems, that administrative ratios were smaller for groups comprised of large school systems than they were for groups comprised of small school systems. Litterer points out (1965:409) that organizational growth is generally accompanied by changes in its administrative structure which are conducive to the organization's over-all efficiency, and therefore, to a decrease in the administrative component.

Increased specialization and coordination of educational activities has created two other phenomena of concern--rapid acceleration of educational costs and a continual increase in educational support staff. Surprisingly, little research has been done regarding the numbers and salaries of support staff in various school systems. However, numerous studies and analyses have been done concerning financial expenditures. Hansen (1969:1) writes, "Expenditures on education are increasing rapidly throughout the world Since 1945 the total expenditure on education in Canada has increased at an average annual rate of 16 per cent." Furthermore, the Canadian Teachers' Federation (1967:21) attributes most of the cost increases to increases in enrolments, inflation, and general improvements in quality of education. The latter is largely due to improved teacher qualifications; hence, the C. T. F. points out (1967:45) that teachers' salaries accounted for 56.4 per cent of the total school board

expenditures in 1963. Although no mention is made of support staff salaries, the C. T. F. report (1967:45) attributes 24.4 per cent of total school board expenditures in 1963 to "other" operating costs. These costs likely are due to salaries of support personnel. Ward's study (1964:17-19) which concerned costs on non-certificated personnel in ten Alberta school units substantiates this view.

These considerations led to questions about ratios and salaries of the administrative component; moreover, they led to unanswered questions regarding support staff ratios and salaries.

THE PROBLEM

Statement of the Problem

This study attempted to describe the relationships between the size of school systems and (1) the size of the administrative, central office, support, non-instructional, and instructional components; and (2) the cost of the administrative, central office, support, non-instructional, and instructional components for twenty-one school systems in three major metropolitan regions in Western Canada during the 1969-70 school year. Further, this investigation attempted to compare staffing ratios and costs of (1) three groups of school systems in metro Vancouver, (2) three groups of school systems in metro Winnipeg, and (3) the three groups of school systems composed of the Vancouver school systems, two school systems in metropolitan Edmonton, and nine school systems in metropolitan Winnipeg. The latter three groups are large urban areas which are comprised of approximately equal populations but are composed of different numbers of school systems and school jurisdictions.

Subproblems. The major problems were separated into a number of subproblems:

1. What relationship exists between the percentage of personnel in administrative positions and the total staff in a school system?
2. What relationship exists between the percentage of personnel in administrative positions and the total number of schools in a school system?
3. What relationship exists between the percentage of personnel in administrative positions and the total number of pupils in a school system?
4. What relationship exists between the percentage of personnel in the central office and the total staff in a school system?
5. What relationship exists between the percentage of personnel in the central office and the total number of schools in a school system?
6. What relationship exists between the percentage of personnel in the central office and the total number of pupils in a school system?
7. What relationship exists between the percentage of staff in support positions and the total staff in a school system?
8. What relationship exists between the percentage of staff in support positions and the total number of schools in a school system?
9. What relationship exists between the percentage of staff in support positions and the total number of pupils in a school system?

10. What relationship exists between the percentage of staff in non-instructional positions and the total staff in a school system?
11. What relationship exists between the percentage of staff in non-instructional positions and the total number of schools in a school system?
12. What relationship exists between the percentage of staff in non-instructional positions and the total number of pupils in a school system?
13. What differences exist among the mean percentages of personnel in the administrative, central office, support, non-instructional, and instructional components in groups of school systems of different sizes?
14. What differences exist among the mean numbers of personnel per school in the administrative, central office, support, non-instructional, and instructional components in groups of school systems of different sizes?
15. What differences exist among the mean numbers of personnel per 1000 pupils in the administrative, central office, support, non-instructional, and instructional components in groups of school systems of different sizes?
16. What differences exist among the mean costs per staff member of central office, administrative, support, non-instructional, and instructional personnel in groups of school systems of different sizes?
17. What differences exist among the mean costs per school of central office, administrative, support, non-instructional,

and instructional personnel in groups of school systems of different sizes?

18. What differences exist among the mean cost per pupil of central office, administrative, support, non-instructional, and instructional personnel in groups of school systems of different sizes?
19. What differences exist among the salary indices of administrative, central office, central office auxiliary, support, non-instructional, and instructional components in groups of school systems of different sizes?
20. What differences exist between the mean percentages of staff in the administrative, central office, central office auxiliary, support, non-instructional, and instructional components in groups of school systems similar in total size but composed of different numbers of school jurisdictions?
21. What differences exist between the mean number of personnel per 1000 students in the administrative, central office, central office auxiliary, support, non-instructional, and instructional components in groups of school systems similar in total size but composed of different numbers of school jurisdictions?
22. What differences exist between the mean cost per staff member for the administrative, central office, central office auxiliary, support, non-instructional, and instructional components in groups of school systems similar in total size but composed of different numbers of school jurisdictions?

23. What differences exist between the mean cost per pupil for the administrative, central office, central office auxiliary, support, non-instructional, and instructional components in groups of school systems similar in total size but composed of different numbers of school jurisdictions?

Justification of the Study

This investigation has distinct implications for the organization and administration of school systems. Data collected and presented here may be used by school officials in forecasting the numbers and specialties of non-instructional personnel whose services will be required as their school system grows. Carter (1968:52) writes, ". . . there are few areas of greater disagreement between a superintendent and board members than the numbers of personnel required for carrying on central office operations." The ratios developed in this study--administrative, central office, non-instructional, and support staff--may be used by administrators for comparison purposes with their school systems, for an understanding of changes that accompany growth of school organizations, and for insight into costs (relative to salaries) of instructional and non-instructional personnel. Changes in the administrative structure, particularly with regard to the addition of new offices, must be considered in terms of the needs and best interests of the districts. Tosi and Patt (1967:162) mention that, "It remains for the administrative unit to justify its cost of operation by the addition of benefits, services, relief, and assistance it provides operating units." Carter (1968:58) writes, "In the past, some school officials have been inclined to follow trends that are

not necessarily consistent with their objectives or specific program requirements."

Although several studies have been done in the area of educational administrative ratios (Gill, Blowers, Vithayathil, Gittell, Terrien and Mills, and Carter), only Carter's study considers the numbers and ratios of support personnel--and he merely incorporated the central office clerical and secretarial staff. One of the purposes of the present study is to determine and compare support staff ratios in school systems of differing sizes. Yeager (1959:7-8) pinpointed the importance of gathering knowledge in this area when he wrote:

The . . . support staff . . . group represents roughly 22 per cent of those engaged in . . . services to the public schools. Moreover, with the extension of new school facilities, including services such as lunchrooms, school transportation, health personnel, and others, the number would appear to be increasing rapidly. Hence, it is important to learn more concerning the status of . . . support staff . . . employees and to provide adequate personnel procedures for their administration.

A major contribution of this thesis may stem from the analysis of the administrative, central office, support, and non-instructional ratios and salaries of metropolitan regions that have approximately equal numbers of pupils but are governed by different numbers of school jurisdictions. Should any major differences be established between mean ratios and/or salaries of administrative, and support personnel, the results of this study may lead to closer examinations of the organization and size of large metropolitan centres.

DEFINITION OF TERMS

Essential Factors Considered in Defining the Administrative Component

Sears (1950:31) identified planning, organizing, directing, coordinating, and controlling as five different activities characteristic of the administrative process. This definition has been supported by Campbell *et al.* (1966:96), and by Griffiths (1962:154). Thus, any person employed in executing the above five activities either in whole or in part may be categorized as an administrator.

Indik (1965:302), in his study, included as supervisors, "those individuals whose functional role mainly involved direct interpersonal supervision and key organizational decision making." This definition implies the exclusion of those personnel that are (1) directly related to pupils and instruction such as teachers and special services personnel; (2) in support positions; and (3) in consultative positions (legal officers, architects, computer analysts, planners) from the administrative component. However, staff serving as coordinators or supervisors of such personnel would be included.

Terrien and Mills (1955:12) included in their study superintendents and assistant superintendents, their immediate staff, principals, and business managers as the administrative component of a school organization. Other personnel, such as "teachers, nurses, custodians, cafeteria workers, and the like," were excluded from the administrative component.

Harris (1963:7-11) used the directness of relationship to pupils and instructional matters to separate administrative staff from non-administrative staff. The exclusion of those personnel who

are not directly concerned with functions relating to pupils and instruction further supplement the categories established by Sears (1950), Indik (1964), and Campbell *et al.* (1966); moreover, it justifies the exclusion of school personnel which Terrien and Mills (1955) did not include in their definition of the administrative component.

Gill (1967:9), Blowers (1969:11), and Vithayathil (1969:5) incorporated the basic principles pertaining to the administrative tasks mentioned thus far in their definition of the administrative component. They excluded people working out of the central office such as guidance officers, visiting teachers, reading specialists, and speech therapists. These people were grouped as central office professional staff in order to differentiate them from the administrative staff. However, staff serving as coordinators of pupil services were included as supervisors.

Campbell *et al.* (1966: 96,133) indicate that the administrative component of school systems should include those concerned with business management, building, and various maintenance departments. The authors maintain that administrative tasks include the following areas: school-community relations, curriculum development, staff personnel, pupil personnel, physical facilities, finance and business management, and organization and structure.

Definition of Administrative Staff (Administrative Component)

Based on the above review of the literature, the administrative component was defined to include all personnel who:

- i) plan, organize, direct, coordinate, and/or control the activities and personnel of the school system;

- ii) make key organizational decisions;
- iii) supervise the work of other personnel; and
- iv) do not work directly with students or their instruction.

All personnel in central offices and in schools who satisfied these criteria were categorized as administrative personnel.

Central office administrative staff (Central office administrative component). The central office administrative staff included all those who were engaged in administrative duties and who worked out of, or in, the central office of the school system. In order to make more meaningful comparisons among groups of school systems of different sizes, the central office administrative staff had been subdivided into four categories:

- i) the "senior" administrative staff which included the superintendent, associate/assistant/deputy superintendents, and the secretary-treasurer;
- ii) the "intermediate" administrative staff which included the directors, assistant directors, assistant secretary-treasurer, administrative assistant, personnel officer, coordinator of data processing, staffing officer, and the like;
- iii) the "supervisory" administrative staff which included all supervisors, assistant supervisors, subject consultants, and subject coordinators involved with instructional matters; and
- iv) the "service" administrative staff which includes all supervisors and directors involved in building and maintenance as well as such personnel as office manager, public relations officer, and clerk of the works.

In-school administrative staff (In-school administrative component). Gill and Blowers restricted school administrative personnel to consist only of principals; Vithayathil included both principals and vice-principals. In this study all principals, assistant principals, head teachers, department heads, assistant department heads, subject coordinators, and business managers located in schools were included on a prorated basis as "in-school administrators."

Administrative staff (Administrative component). The administrative staff of a school system was comprised of the central office administrative staff and the in-school administrative staff.

Central Office Auxiliary Staff (Central Office Auxiliary Component)

The central office auxiliary staff consisted of all personnel with university training or the equivalent, who worked out of, or in, the school board's central office, in non-administrative tasks. This category was divided into two sub-categories:

- i) the pupil-oriented, special services personnel such as social workers, psychologists, speech therapists, remedial clinicians, and the attendance officer; and
- ii) the central office specialist personnel who were primarily in consultative positions such as the legal officer, architect, planner, program analyst, engineer, purchasing agent, and computer programmer.

Support Staff (Support Component)

Yeager (1959:6), in his analysis of the distribution of non-instructional personnel throughout all school systems in the United

States found that, " . . . by far the largest single group . . . of non-instructional personnel . . . are plant personnel . . . the next largest group are food service personnel . . . transportation personnel follow third." Other large groupings he included in his analysis were nurses, dental hygienists, recreational personnel, attendance officers, teacher aides, and secretarial and clerical personnel.

Support personnel, as described by Yeager, may be located in either the central office or in schools. The central office support staff in this study were comprised of all clerical and secretarial personnel, plant operation and maintenance personnel, transportation personnel, and groundkeepers that were centrally employed by the school system. Support staff located in schools such as secretarial and clerical personnel, custodians, and teacher aides were categorized as "in-school support personnel." Thus, the support staff component was comprised of all central office and in-school support staff within a school system.

Central Office Staff (Central Office Component)

All central office personnel in the administrative, auxiliary, and support components, comprised the "central office staff."

Non-instructional Staff (Non-instructional Component)

Yeager (1959:6) writes, "Non-instructional personnel are those personnel whose services are auxiliary to the instructional process but not directly related to it." This definition was accepted, meaning that all central office personnel and all administrative and support personnel located in schools comprised the non-instructional component.

Instructional Staff (Instructional Component)

The instructional component included teachers in schools who were engaged in classroom instruction. In-school administrators were excluded; however, that prorated portion of an administrators' time which was allocated to classroom instruction was included in the instructional component. Thus, if an administrator spent 60 per cent of his time in administrative duties and 40 per cent of his time in classroom instruction, then 0.6 full-time equivalents were charged to in-school administration and 0.4 full-time equivalents to the instructional component.

Administrative Cost (Cost of Administrative Staff)

The total gross salaries paid to central office administrative personnel and to in-school administrators on a prorated basis constituted the administrative cost.

Support Cost (Cost of Support Staff)

The total gross salaries paid to central office and in-school support personnel were categorized as the support costs.

Central Office Cost (Cost of Central Office Staff)

The central office cost included the total gross salaries of all central office personnel.

Non-instructional Cost (Cost of Non-instructional Staff)

The total gross salaries paid to all non-instructional personnel formed the non-instructional costs.

Instructional Cost (Cost of Instructional Staff)

The instructional cost was comprised of the total gross salaries of all instructional personnel.

Size of the School System

Three separate measures of the size of the school system were used:

- i) the total number of staff in the system;
- ii) the total number of schools in the system; and
- iii) the total number of pupils in the system.

Measures (ii) and (iii) were in accordance with Vithayathil (1969:8-9), and Blowers (1969:12-13); however, non-professional personnel, that is support staff, were included in the first measure of school system size. The acceptance of this definition deviated somewhat from that of Vithayathil and Blowers who included only professional personnel in this measure.

Ratios of Administrative, Central Office, Support, Non-instructional, and Instructional Personnel

Each of these ratios were expressed as:

$$\frac{\text{Total number of personnel in the category}}{\text{Size of school system}}$$

In the data analysis, some of these ratios were converted into percentages.

Cost Ratios of Administrative, Central Office, Support, Non-instructional, and Instructional Personnel

These ratios were expressed as:

$$\frac{\text{Total gross salaries of all personnel in the category}}{\text{Size of the school system}}$$

Salary Indices (Cost Indices)

Salary indices were computed for administrative, central office staff, central office auxiliary, support, non-instructional, and instructional personnel.

In each case the index was expressed as a percentage of total operational expenditures according to the following ratio:

$$\frac{\text{Total gross salaries of all personnel in the category}}{\text{Total operational expenditures}}$$

The total operational expenditures did not include debt charges, transfers to capital funds, or capital expenditures that may have occurred during the school year.

ORGANIZATION OF THE STUDY

Chapter 1 contains a statement of the problem, the subproblems derived from it, and definition of terms used in this study.

In Chapter 2 pertinent literature related to the present study is reviewed.

The sample, research procedures, methods and instruments used for data collection, and the descriptive statistics employed in this study are described in Chapter 3. The assumptions and limitations of this study are also included in this chapter.

Data pertaining to numbers and ratios of personnel in various components are analyzed in Chapter 4. Subproblems 1 to 15 are also investigated in this chapter and some descriptive statistics are applied.

Chapter 5 contains the analysis of data pertaining to costs in terms of gross salaries of the various components of a school system.

In Chapter 6, descriptive analyses of ratios and costs are made of groups of school systems that contain approximately equal numbers of pupils but are comprised of different numbers of school jurisdictions.

Chapter 7 contains the conclusions of this study, implications for practice, and recommendations for further study.

Chapter 2

REVIEW OF THE LITERATURE

The understanding of organizational growth has become an area of increasing concern in both industrial and educational fields. However, conflicting results of numerous studies in these areas have cast some shadow of doubt upon the reliability of the findings.

Studies Pertaining to Organizational Growth

Parkinson's statistics (1957:15-29) on occurrences in the British Navy and in the British Colonial Office enabled him to formulate his partially humorous, partially serious "law"--that the administrative component increases at a steady rate of 5.6 per cent per year irrespective of increases or decreases in the work load.

The Terrien and Mills study (1957:11-13) of the elementary, high, and unified school districts in California attempted to determine the relationship between the administrative component of school districts and the total size of the districts. They included superintendents, their assistants and immediate staff, principals, and business managers in the administrative component of a school organization. Accordingly, Terrien and Mills (1957:11) formulated the following hypothesis:

The relationship between the size of the administrative component and the total size of its containing organization is such that the larger the size of the containing organization the greater will be the proportion given over to its administrative component.

Each of the three types of districts was divided into groups of small, medium, and large systems according to their number of employed personnel. The researchers found (1957:13) that in all three types of districts the proportion of the organization which was administrative rose from small through medium to large-sized districts.

Caplow (1957:503) refers to the two studies mentioned above when he writes, "There is an almost universal belief that the administrative and overhead components of any organization increase out of proportion to increases in size." However, he goes on to point out that few empirical investigations bear directly on this point and that these few studies consider evidence that is largely indirect and based on particular plants. Caplow's criticisms are ostensibly justified by the findings of several cross-sectional and longitudinal studies conducted in hospitals, industry, and education.

For example, Anderson and Warkov (1961:26) found in their cross-sectional study of forty-nine veterans' hospitals in the United States, that the larger the hospital, the smaller the percentage of administrative personnel tended to be. On the surface these findings were in direct contradiction to those reported by Terrien and Mills. Anderson and Warkov, however, were careful to point out that the school districts studied by Terrien and Mills were generally comprised of differing numbers of locations (schools) whereas each of their organizations studied was based on a single location. Upon this observation they (1961:27) attempted to mitigate the differences in findings by suggesting the following propositions:

1. The relative size of the administrative component decreases as the number of persons performing identical tasks in the same place increases.

2. The relative size of the administrative component increases with the number of places at which work is performed increases.

3. The relative size of the administrative component increases with the number of tasks performed at the same place.

According to the second and third propositions, the relative size of the administrative component should increase as the number of schools in a district increases and as the organizational complexity (specialization and differentiation of roles) within a district increases.

Indik's investigation (1965:306-307) of the relationship between organization size and supervision ratio in five different types of organizations led him to the conclusion that organizational size and supervisory ratio were negatively correlated. He (1965:309) attributed the differences between his findings and those of Terrien and Mills to the latter's inclusion of "staff nonsupervisory personnel in their administrative component." This comment has implications for the present study. The non-instructional ratios developed include all support personnel in their calculations. Should Indik's assumption be completely correct, non-instructional ratios reported here should support the findings of Terrien and Mills.

In a historical examination of four manufacturing firms, Haire (1959:296-297) concluded that management grows at a slower rate than does the total organization and therefore becomes an increasingly smaller part of the whole. He writes that top management of an organization is fairly stable and accommodates any increase in size of the organization by increasing each administrator's span of control. Further, he writes (1959:292-293) that in the early years of an organization, the staff component increases rapidly; however, in later growth, the line and staff components increase proportionately.

In 1963 Haas, Hall, and Johnson studied thirty organizations that ranged extensively in size and kind. They (1963:12) supplanted the conventional "administrative" with "supportive" component; the latter included all those personnel who were engaged in such activities as "bookkeeping, personnel administration, and maintenance services." Further, they dichotomized all organizational personnel into "direct" versus "supportive" categories; the distinction being based on the nature of the activity performed and the relation (direct or indirect) of the activity to organizational goals. The major purpose of the research was to determine the relationship between the relative size of the supportive component and other organizational characteristics. They established (1963:12-17) that, for the various organizational types, the size of the supportive component tended to be inversely related to total size.

Carter (1968:52) conducted a survey based on 741 districts in fifty states in the United States to try to determine how districts would staff their central offices during the 1968-69 school year. School officials participating in the survey indicated the number of all full-time central office or district-wide personnel that were to be employed. For comparative purposes, the school districts were separated into eight categories according to the number of students enrolled, and central office personnel ratios were then determined for each. These ratios are represented in Table 1.

Carter (1968:55) observed:

Contrary to frequent assumption, the total number of central office personnel per 1000 students in districts with enrollments in excess of 75,000 is higher--by at least 0.5--than the number of districts in other enrollment categories with more than 6,000 students.

Table 1
Central Office Personnel Ratios^a

Category of District by Number of Students	Number of Central Office Personnel per 1000 Students
More than 75,000	3.275
50,000 - 75,000	2.605
25,001 - 50,000	2.763
12,001 - 25,000	2.611
6,001 - 12,000	2.392
3,001 - 6,000	3.443
1,201 - 3,000	4.639
1,200 or fewer	9.883

^aThis table contains data from the cross-sectional study by Carter (1968:53).

To explain this finding, Carter then calculated several ratios for administrative and non-administrative personnel. He found (1968: 55) that small districts had the highest administrative ratio and attributed it to the assignment of duties to central office administrative personnel which are ordinarily assumed by the school staff in large districts. Further, he found that districts with enrolments of over 75,000 had the lowest administrative ratio but the highest non-administrative ratio; that is, these districts made more use of support resources such as data processing, secretarial, and clerical personnel. Nevertheless, his results partially support the justification presented by Anderson and Warkov for the observed differences between their results and those of Terrien and Mills.

The findings of the Haas, Hall, and Johnson study conflict somewhat with those of Carter. Whereas Carter's study indicates that administrative and clerical staff increases for very large educational organizations, the former study clearly reveals the opposite tendency for the supportive component of non-educational organizations (the only educational organization included in the research was a private denominational university). The supportive component, as defined by Haas *et al.*, bears strong resemblance to the "non-instructional" component in this study.

Three Canadian studies concerning administrative ratios of educational organizations have recently been completed at the University of Alberta. In a cross-sectional study of thirty-eight school systems in Western Canada, Gill (1967:46) found that the relative size of the administrative component decreases as the school system

increases in size. Similar results were obtained by Vithayathil (1969:74) in a cross sectional study of 108 school districts in the province of Alberta, and by Blowers (1969:67) who expanded Gill's study on a longitudinal basis. For comparative purposes of obtained results, both similar definitions of "administrative personnel" and a categorization of the school systems into three groups according to size (Table 2) were employed in the three studies. Only administrators at the central office and principals of schools (Vithayathil also included vice-principals) were included in these studies--even though their definition was satisfied by several more categories of personnel located in schools. Furthermore, no support personnel of any type were included. Although a similar definition of administrative personnel was accepted in this study, assistant principals, business managers, administrative assistants, department heads, and subject coordinators as well as principals were included in calculations of administrative ratios. Other calculations of ratios included all non-instructional personnel, that is, administrative, auxiliary, and support personnel.

Studies Pertaining to Support Personnel

The so-called "Parkinson's Law" (1957) has drawn attention to organizational growth and particularly to the clerical and secretarial function in modern organizations.

Haire, concerned with the rise of the clerical function, prepared a special tabulation of all people in the four industrial firms he studied who were "primarily paper handlers of one sort or another." He found (1959:297) that, "The total number of clerical

Table 2

Comparison of Mean Percentages of Staff in Administrative
Positions in Groups of School Systems
of Different Sizes^a

Group	No. of school systems in group	Size range of school systems (Total number of teachers plus C.O. prof. and admin. staff)	Mean percent- age of staff in admin. positions	Standard deviation
1	14	56-143	9.66	2.67
2	12	171-400	9.10	2.14
3	9	515-1147	7.07	1.59
4	6	1384-3700	6.62	1.38
F	4.48	p	0.009	

^aTaken from Blowers' thesis (1969:73)

workers does increase as the company increases . . . as the companies went from forty to eighty employees, the clerical staff doubled"

The Canadian Education Association (1964:2-9) initiated a research project to survey the numbers of clerical workers employed by seventy-nine urban boards (fifty-eight were eventually used) in Canada. In order to determine the relationship between size of the school system and the amount of clerical assistance provided, four categories based on numbers of pupils were constructed. Ratios calculated in terms of number of teachers and pupils per clerical worker were then determined to facilitate comparisons between these categories. The general conclusion of the C. E. A. (1964:5) arising from tabulated results was that the size of the school system seems to have little effect upon the clerical assistance ratios. Recategorization of the data by provinces and boards, and further calculations of ratios, showed that there were some differences among Canadian regions in the provision of clerical assistance, and that there were very noticeable differences among boards in the amount of clerical assistance provided for elementary and secondary schools.

Little research has been done concerning numbers of teacher aides and technical assistants in school systems. The National Education Association (1967:14-15) reports that in 1965, 428 of 629 school districts in the state of New York employed 3,134 teacher aides and that ninety-three per cent of the districts considered their experience with aides favorable. Further, the N. E. A. predicted (1967:14) that, "One day auxiliary personnel may outnumber teachers."

Studies Pertaining to Salaries and Costs

The costs of education, both in absolute terms and in relation to various indices of growth in the economy, have increased sharply in the post-war period. The Canadian Teachers' Federation (1967:23) estimates that the average annual percentage increase between 1946 and 1965 was 13.5 per cent; Hansen (1969:1) states that the annual increase during this time was 16 per cent. Further, Hansen (1969:1) writes that in 1968 the total expenditure on education was estimated at six billion dollars or nine per cent of the gross national product. These increases in expenditures are likely to continue because of our general conviction that every individual has the right to obtain an education to the limit of his capacity.

The C. T. F. reports (1967:44-46) that school boards spend two-thirds of all the money spent on formal education and that the majority of these expenditures are for operating costs--of which teachers' salaries constitute approximately 70 per cent. The balance of the operating costs are for materials, equipment, and salaries of support personnel.

Ward (1964) attempted to cost the services of non-instructional personnel in ten selected school units in Alberta. He classified all personnel into four categories: elected personnel, office staff, plant maintenance and operation personnel, and personnel engaged in pupil transportation (1964:16-17). Total costs for each category and for each school unit were determined; furthermore, per pupil costs were calculated for each category. Included in "cost" figures were salaries, mileage, materials, and various fringe benefits. In his

findings (1964:42-47), Ward notes that total non-instructional costs increased as the number of pupils increased; however, the reverse was true when costs were expressed in per pupil terms. Additionally, the study discovered that for each of the ten participating districts the highest cost was for personnel involved in pupil transportation. Costs related to personnel engaged in plant maintenance and operation, office staff, and elected personnel ranked second, third, and fourth respectively. This order applied to both total costs and per pupil costs.

In a companion study, Percevault attempted to determine the total costs of the administrative services of certificated personnel employed by the same ten school divisions and counties in Alberta that Ward investigated. The costs included the actual administrative allowance received by each locally employed administrator. Further, the basic salary was prorated in proportion to the fraction of time spent on administrative duties to determine that amount which was an administrative cost as distinct from an instructional cost. The sum of these two comprised the actual administrative cost (Percevault, 1964:17-18). Of the five cost factors which Percevault (1964:36-54) analyzed in his attempt to explain variations in per pupil costs, salary schedules and qualifications of administrative staff were found to be less significant, whereas size and type of school, administrative time provided, and number of administrative staff employed were found to be more significant.

Another similar study was conducted by Small (1967) who accepted both Percevault's definition of an administrator and his

formula for determining the administrative costs of "resident administrators," that is, administrators located in schools. The total "administrative service cost" was comprised of resident administrative costs and "other administrative service costs" (salaries and wages of central office personnel, school supportive staff, maintenance and contracted services). In his findings, Small (1967:56,59) reports that resident professional administrative services constituted 35.2 per cent of the total administrative service cost and that costs increased substantially with increasing grade level. By comparing the total administrative service costs to total current expenditures (this figure was extracted from data in budgets), Small (1967:56) was able to establish Edmonton's administrative service index at 23.1 per cent, that is, 23.1 per cent of current expenditures were spent in the form of salaries, wages, and expenses of all administrators.

Myroon (1969:132), in a cost analysis of schools in Thorhild County found that instructional salaries (costs borne by teachers' salaries) were the greatest single cost incurred by school districts and accounted for almost 60 per cent of the per pupil costs. Transportation costs came second and accounted for almost 15 per cent. Local school administration salaries, central office administration salaries, plant maintenance, plant operation salaries and utilities, in descending order accounted for almost 20 per cent of costs (Myroon, 1969:132-133). Further results of Myroon's study (1969: 133-136) were that the relationship between per pupil costs and enrolment appeared to be curvilinear with the per pupil costs consistently higher in schools with lower enrolments, and that per pupil costs by

grade division increased rapidly as the grade levels ascended from Division I through Division IV.

Summary of Chapter 2

Findings of research that is pertinent to the present investigation suggest that administrative ratios and school system size are negatively correlated. However, conflicting evidence regarding the inclusion of support personnel in the calculation of non-instructional ratios made accurate prediction of the size and direction of the correlation coefficient between the non-instructional component and school system size impossible. For instance, Indik pointed out that his results were incongruent with those of Terrien and Mills because the latter included some support personnel in their category of administrators. Furthermore, although Carter found that administrative ratios tend to decrease as the school system size increases, he also stated that non-instructional ratios increase as systems become very large. Haire agreed that the number of clerks steadily increases but also felt that growth is not a function of size, but a function of time. The findings of Haas, Hall, and Johnson support Haire's statement; they concluded that the supportive component is inversely related to organizational size.

None of the mentioned studies attempted to compare staffing ratios of large school systems with those of a combined number of smaller systems.

There is apparent agreement in the literature that salaries of teachers, administrators, and support personnel comprise a major portion of the school board operating expenditures (Ward, Percevault,

Myroon, C. T. F., Small). Furthermore, there is a general consensus that per pupil administrative costs are negatively related to increasing school size, and positively related to increasing grade level. However, only Small attempted to determine an "administrative service index."

Chapter 3

DESCRIPTION OF THE SAMPLE AND RESEARCH PROCEDURES

Description of the Sample

This study was part of a group project which attempted to determine what differences existed in administrative, central office, support, and non-instructional ratios among (1) groups of metropolitan school systems of different sizes, and (2) large metropolitan areas in Western Canada which were similar in size but composed of differing numbers of school jurisdictions. The purposes of this study restricted the choice of the sample to school systems in the major metropolitan regions in Western Canada. A "metropolitan region" consists of a large urban centre and other urban areas in its immediate geographical vicinity; each area being comprised of one or more school systems or school jurisdictions. Although the systems investigated differed substantially in size and in geographical location, they were quite alike in their administrative apparatus. Each was governed by a board and coordinated by a central office staff that was headed by a superintendent.

Of the seven major metropolitan areas in Western Canada, this study investigated Vancouver, Victoria, and Winnipeg; Olynyk (1970), in her companion study, investigated Calgary, Edmonton, Saskatoon, and Regina. Metropolitan Vancouver included nine school systems; metropolitan Victoria was comprised of three school systems; and metropolitan Winnipeg was composed of ten school systems. Thus, the sample

for this study was comprised of three metro areas and twenty-two school systems. Combined with the eight school systems in Olynyk's study, the group project was comprised of seven metropolitan regions and thirty school systems.

Of the twenty-two school systems approached for information by this study, twenty responded with complete data. These included all twelve systems in the two metropolitan areas in British Columbia, and eight school systems in the metro area in Manitoba. One other system in the metro area in Manitoba provided partial data.

Since the sample was deliberately and not randomly chosen, the ratios and statistics calculated were descriptive of the school systems investigated. Hence the findings were not inferred to a larger population.

Assumptions and Limitations

The validity of this study was dependent upon the accuracy and completeness of data provided by the individual school systems in the sample. The assumption was made that the officials in the school systems correctly interpreted and clearly understood the nature of the information required, and that the data they supplied was accurate and complete. A further assumption was that the description of administrative offices was perceived in a similar fashion by all who were supplying the information.

Since the study was a cross-sectional one, the findings represent a state of equilibrium having applicability to growth but do not represent a strict growth curve. Although this is a limitation

that must be recognized, findings by longitudinal studies may be more severely limited since they may reflect such uncontrollable factors as changes in the environment and in governmental policies regarding education.

Another limitation of this study concerned the numbers of auxiliary staff employed by various school systems. Many school systems do not hire such pupil service personnel as psychologists, medical consultants, public health nurses, dentists, et cetera, but rather contract these services to health organizations. In those provinces where the provision of such pupil services is compulsory by governmental policies, each district is eligible for a subsidy that alleviates, to a degree, the financial burden imposed upon it. Unfortunately, no standard formula for assessing the subsidy exists. Therefore, obtaining an accurate number of such personnel that a board would employ if it were to hire staff for the provision of these services became virtually impossible.

Lack of complete data concerning the numbers and total gross salaries of in-school personnel for system M12 created a further limitation of this study. Missing figures for this system were obtained by projecting data received from systems M11 and M13.

Total gross salaries obtained for various components of each school system may have been a reflection of various external factors of the region such as its economics, philosophy, and governmental policies rather than internal factors such as size of the school organization.

Delimitations

This study was delimited to school systems in large metropolitan areas to facilitate the comparison of ratios of a large system with those of a combination of smaller systems in one metropolitan region. Further, all school systems selected were in Western Canada.

In-school personnel such as guidance counsellors, school librarians and their assistants, and head caretakers who satisfied the definition of "administrative personnel" that was adopted in this study, were excluded from the "in-school administrative" component. Procuring accurate estimates of administrative time provided for these employees was felt to be too onerous a task; furthermore, the addition of such information would not have appreciably altered the ratios obtained.

Methods Used for Data Collection

Three general methods were employed in the collection of data. First, the superintendent of each participating school system received a questionnaire (Appendix A) which required information on (1) the numbers of schools, teachers, and pupils; (2) the positions, numbers, and total gross salaries of administrative personnel located in the central office and in schools; (3) the positions, numbers, and total gross salaries of support personnel located in the central office and in schools; (4) the positions, numbers, and total gross salaries of auxiliary personnel located in the central office; and, (5) the operational expenditures for the 1969-70 school year. An explanatory letter (Appendix A) which accompanied the questionnaire described

the purpose and nature of the research and contained a general description of the data required.

Second, follow-up letters were sent to those systems which failed to respond to the first request. Letters were also employed to obtain missing information, and to clarify certain information received.

Third, personal interviews were conducted with the superintendent and/or other officials of each district in order to discuss the project, to answer any questions that may have arisen regarding terminology and the accumulation of required data, and to assist in extracting some data.

Instruments Used for Data Collection

A questionnaire (Appendix A) was prepared, based on information gathered from the literature, requesting the information required. As the questionnaire approached final form, it was submitted to eight graduate students and three professors in the Department of Educational Administration at the University of Alberta for suggestions and constructive criticisms. The suggestions offered resulted in a revision of the questionnaire to ensure more accurate interpretation of all its sections. The consensus was that school systems could provide the necessary data and that the administrative personnel could be identified by the descriptions used.

Analysis of Data

The raw data provided by the twenty-one school systems were organized into Tables 3, 7 to 11, and 19 to 21. These are explained

in Chapters 4 and 5. The sizes of administrative, central office, support, non-instructional, and instructional components and the total sizes of school systems were calculated according to the definitions adopted in Chapter 1. Using these variables, all ratios, as defined in the first chapter, were computed for each school system.

Pearson product-moment correlations were used to determine the relationships between the percentage of (1) total administrative staff, (2) total central office staff, (3) total support staff, and (4) non-instructional staff with three separate measures of school system size. Correlations that were equal to, or greater than $|\ .40 |$ were considered to be "significant" and "high." They could be considered (1) significant if the school systems studied are considered part of a population of Canadian school districts; and (2) high if the school systems investigated are considered to be a population of metropolitan school systems in Western Canada. In either case, the correlations were used purely in a descriptive sense.

The overall sample was categorized into four subgroups according to size, and the means of the administrative, central office, support, non-instructional, and instructional ratios were computed for each. These means indicated whether any differences tended to exist among the subgroups with regard to the number of personnel in each component. The mean number of personnel per 1000 pupils for the different variables comprising the non-instructional component was computed for each subgroup. This was done in an attempt to determine whether there tended to be any differences among the four groups of school systems in the number of staff employed in the various categories which constituted the non-instructional component.

Means were also determined for each group with respect to the total gross salaries of all personnel in each of the administrative, central office, support, non-instructional and instructional components.

Salary indices for various components of each school system were obtained by expressing the cost of the component as a percentage of operating expenditures. To determine whether any differences existed among the salary indices of large and small school organizations, mean indices of the major components were computed for the four groups. The results obtained were graphed to portray the differences more clearly.

To compare the organization of a large urban system with that of a combination of smaller metropolitan systems, mean ratios of the total number of personnel in, and of the total cost of, the various components in a system defined in Chapter 1 were calculated for each.

Chapter 4

PRESENTATION AND ANALYSIS OF DATA PERTAINING TO THE NUMBERS OF PERSONNEL IN VARIOUS COMPONENTS

The data received from the superintendents of twenty-one school systems in three of the major metropolitan areas in Western Canada are presented in this chapter and in Chapter 5. This chapter also contains analysis of the data concerning the numbers of administrative, central office, support, non-instructional, and instructional personnel.

PRESENTATION OF THE DATA

Raw Data

Table 3 shows the numbers of schools, teachers, and pupils in each of the twenty-one Western Canadian school systems for the 1969-70 school year. The number of teachers reported included classroom teachers, guidance counsellors, librarians, and that prorated portion of time spent by administrative personnel in classroom instruction; however, it excluded that prorated portion of time spent by administrative personnel in administrative duties.

Table 7 indicates the numbers of central office administrative personnel in each of four subgroups: senior, intermediate, supervisory, and service. These categorizations were made by virtue of the position held by each staff member and were in strict accordance with the definitions accepted in Chapter 2. The types of positions that

Table 3
Numbers of Schools, Teachers and Pupils

School system identifier ^a	Total number of schools	Total number of teachers ^b	Total number of pupils
B11	111	2784.8	75,007
B12	50	1138.6	29,083
B13	74	1081.5	27,557
B14	47	883.4	23,941
B15	45	876.0	21,592
B16	42	607.0	15,853
B17	22	390.7	9,703
B18	16	347.1	8,172
B19	9	242.2	6,153
B21	57	1264.8	32,470
B22	19	221.1	6,324
B23	18	214.4	5,001
M11	82	2043.0	48,106
M12	35	857.2	19,208
M13	24	517.5	12,483
M14	14	242.5	8,694
M15	15	319.5	7,016
M16	17	268.0	6,774
M17	11	259.3	6,129
M18	9	157.5	3,745
M19	6	141.4	3,034

^aIn the school system identifier, the letter represents the province: B = British Columbia and M = Manitoba. The first digit in the identifier represents a metropolitan area within the province and the second digit indicates a specific school system. The same identifiers are used for each system throughout this thesis.

^bThese figures include that prorated portion of time spent by administrative personnel in classroom instruction and excludes that prorated portion of time spent in administrative duties.

Table 4

Classification of Central Office Administrative
Personnel by Position^a

Senior	Intermediate	Supervisory	Service
Chief superintendent	Director/assistant of program branches	Supervisor/assistant of subject area	Superintendent/assistant of maintenance
Superintendent of schools	Program and curriculum assistant/officer	Subject consultant	Superintendent/assistant of buildings and grounds
Assistant superintendent of schools	Administrative assistant	Subject coordinator	
Associate superintendent of schools	Assistant secretary- treasurer		
	Accountant	Subject specialist	Clerk of the works
	Comptroller		
Deputy superintendent of schools	Research director		Director of maintenance and/or grounds
	Assistant research director		
Secretary-treasurer	Supervisor/coordinator of data processing		Custodial inspector
	Personnel officer		Warehouse manager
	Staffing officer		Office manager
	Inspector of schools		
			Public relations officer
			Information officer
			Library officer

^aThis classification is in order with the definitions in Chapter 1.

Table 5

Classification of Central Office Auxiliary Personnel into
Pupil-Oriented and Specialist Personnel

Pupil-oriented	C.O. specialist personnel
Medical consultants	Computer programmer/analyst
Psychologists	Legal officer
Dentists	School architect
Public health nurses	Engineer
Psychometrists	Purchasing agent
Counsellors	Planner
Social workers	
Dental nurses	
Remedial specialists	
Speech specialists	
Truant officers	

Table 6

Categorization of In-school and Central Office Support Staff by Function

In-school support				Central office support		
Clerical	Plant operation and maintenance	Teacher aides	Other	Clerical	Plant operation and maintenance	Other
Secretary	Custodians	Laboratory	Transportation	Secretary	Carpenter	Receptionist
Typist	Head caretaker	Library	Cafeteria	Typist	Electrician	Switchboard operator
Clerk		Paraprofessional		Chief clerk	Painter	Graphic artist
		Marker		Clerk	Truck driver	Computer operator
		Noon-hour supervisor		Stenographer	Warehouse worker	
				Payroll clerk	Storekeeper	Keypunch operator
				Substitute teacher service	Grounds personnel	Transportation personnel
				Instructional materials centre staff		Chauffeur
				Cataloguer		Draftsman
						Photographer

Table 7

Numbers of Central Office Administrative Personnel

School system identifier	Central office administrative personnel				
	Senior	Intermediate	Supervisory	Service	Total
B11	5	18	30	10	63
B12	2	6	8	2	18
B13	3	6	9	4	22
B14	2	6	9	4	21
B15	3	6	6	4	19
B16	2	4	3	4	13
B17	2	4	2	3	11
B18	2	2	3	4	11
B19	2	3	3	2	10
B21	2	12	16	8	38
B22	2	3	3	2	10
B23	2	2	4	2	10
M11	7	10	32	21	70
M12	5	5	9	2	21
M13	4	5	1	3	13
M14	4	1	4	2	11
M15	3	1	1	2	7
M16	3	1	6	1	11
M17	3	1	5	1	10
M18	2	0	9	1	12
M19	2	0	5	1	8

were included in each of the four categories are listed in Table 4. Although the number of "senior" administrators showed little variation among the twenty-one school systems, the number of "intermediate" administrators ranged from one to eighteen. Furthermore, the number of "supervisory" personnel, that is, those staff members that were directly concerned with pupils and improvement of their instruction, showed the greatest variability--from a low of one to a high of thirty-two. Thus, the total central office administrative staff ranged from seven through seventy.

Table 8 reveals the numbers of pupil-oriented and specialist personnel who comprised the two sub-categories of the central office auxiliary component. Separation of auxiliary staff into these two sub-categories was accomplished on the basis of the function performed by each staff member. Table 5 contains a list of personnel included in each subgroup. Obtaining accurate figures for the number of pupil-oriented auxiliary personnel in each school system proved to be exceedingly difficult. Most school systems in British Columbia could not provide the number of such personnel available to their systems because health services were contracted to various health organizations. Normally these health organizations offered their services to two or three adjacent school systems as well as to the community members. This study estimated the number of pupil-oriented auxiliary personnel that each system would have employed centrally if these services were not contracted by first, assigning an average salary figure per staff member to the area, and second, by determining the quotient between the total contribution by each system to a health

Table 8

Number of Central Office Auxiliary and Support Personnel

School system identifier	C.O. auxiliary personnel			C.O. support personnel			
	Pupil- oriented	Specialist	Total	Clerical	Main- tenance	Other	Total
B11	66	8	74	81	301	25	415
B12	46	3	49	14	38	2	54
B13	6	1	7	22	81	8	111
B14	4	2	6	16	33	1	50
B15	36	5	41	29	18	5	52
B16	29	1	30	17	19	6	42
B17	2	1	3	11	28	1	40
B18	15	1	16	12	18	1	31
B19	3	1	4	9	12	-	21
B21	32	4	36	45	78	3	126
B22	1	0	1	3	9	5	19
B23	1	0	1	5	9	7	21
M11	58	7	65	87	143	10	240
M12	13	0	13	24	10	6	40
M13	7	0	7	11	8	32	51
M14	6	1	7	4	12	1	17
M15	6	1	7	3	2	1	6
M16	6	0	6	9	16	1	26
M17	5	0	5	5	4	2	11
M18	2	0	2	4	2	1	7
M19	2	0	2	3	2	3	8

services organization and the assigned salary figure. The number thus obtained was added to any pupil-oriented auxiliary staff that were centrally employed to yield the total pupil-oriented auxiliary staff for the system. This estimated figure was probably in substantial error since all systems did not contribute financially to a health organization at a standardized rate. Governmental grants varied with the economic base of each system; therefore, the actual amount contributed by each system was not primarily dependent upon system size.

The numbers of central office support personnel, as separated into three categories according to the function performed, are also shown in Table 8. A list of personnel included in each category is available in Table 6. Table 8 reveals large variations in size in both the clerical (from 3 to 87) and maintenance subgroups (from 2 to 301).

The numbers of in-school administrators in full-time equivalents for each type of school are presented in Table 9. These figures include all principals, assistant/vice-principals, head teachers, department heads, assistant department heads, subject coordinators, and business managers located in schools on a prorated basis. To prorate time of administrators, estimated percentages of time spent in non-teaching duties by staff in each of the above positions were obtained from the superintendent or other officials in each school system. For example, if elementary school principals in school system "X" were reported to spend an average of 60 per cent of their time in non-instructional duties and 40 per cent of their time in an instructional capacity, then 0.60 of all elementary school principals

in system "X" were charged as administrative staff in full-time equivalents, and 0.40 of the total number of elementary school principals in this system were designated as instructional personnel in full-time equivalents. This portion was then added to the instructional component and is shown in Table 3. Part of the large variation in the numbers of instructional personnel and in-school administrative staff for each type of school is due to the inclusion of different grade levels within each. School systems in British Columbia incorporate grades one to seven in elementary schools, eight to ten in junior secondary schools, and eleven to thirteen in senior secondary schools, whereas school system in Manitoba include grades one to six in elementary schools, seven to nine in junior high schools, and ten to twelve in senior high schools.

Table 9 contains only the total number of administrators in full-time equivalents for each type of school. A complete analysis of the numbers of personnel in each administrative position for the different types of school in each school system as well as the estimated percentages of the time spent in non-teaching duties is provided in Appendix B.

In-school support personnel were sub-divided into four groups according to function. The personnel included in each subgroup are listed in Table 6. The numbers of staff members in the three categories and the total number of in-school support staff are shown for each school system in Table 10. System M19 has six clerical, thirteen maintenance, and zero aides located in its schools--these figures were the lowest in all three categories. In contrast, school system

Table 9

Numbers of In-school Administrators in Full-time Equivalents
for Each Type of School^a

School system identifier	Elem- entary	Junior high	Senior high	Elem.- junior high	Junior- senior high	Other	Total
B11	101.1	-	-	-	82.1	-	183.2
B12	46.1	21.2	11.6	-	3.5	-	82.4
B13	30.4	18.9	10.2	-	-	-	59.5
B14	30.4	15.5	5.4	-	2.3	1.0	54.6
B15	25.4	8.0	7.3	-	10.3	-	51.0
B16	21.4	8.8	3.8	-	-	-	34.0
B17	10.6	2.5	-	-	5.2	-	18.3
B18	12.6	-	-	-	13.3	-	25.9
B19	9.8	-	-	-	5.0	-	14.8
B21	16.0	14.2	9.3	1.1	2.0	3.6	46.2
B22	7.3	2.3	1.0	0.3	1.0	-	11.9
B23	6.5	3.0	1.1	-	-	-	10.6
M11	57.1	12.5	17.4	12.0	29.0	-	128.0
M12	21.0	8.0	10.5	3.3	-	-	42.8
M13	13.5	6.0	8.6	2.4	-	1.0	31.5
M14	10.0	4.0	2.0	4.5	2.0	-	22.5
M15	5.7	-	6.3	10.5	-	-	22.5
M16	10.6	3.6	5.0	1.8	-	-	21.5
M17	7.5	-	2.5	4.5	2.2	-	16.7
M18	1.5	-	1.8	3.2	-	-	6.5
M19	2.2	-	2.2	3.2	-	1.8	9.4

^aComplete analysis of the in-school administrative personnel located in each type of school in each school system is provided in Appendix B.

Table 10
Numbers of In-school Support Personnel in
Full-time Equivalents

School system identifier	Clerical	Maintenance	Aides and paraprofes- sionals	Other	Total
B11	187	379	229	-	795
B12	75	152	86	-	313
B13	98	175	28	1	302
B14	73	90	21	21	205
B15	60	130	27	2	219
B16	34	82	2	-	118
B17	28	48	-	3	79
B18	26	49	25	-	100
B19	19	41	-	-	60
B21	78	184	21	1	284
B22	15	35	8	-	58
B23	9	36	1	-	46
M11	148	316	127	16	607
M12	46	96	-	-	142
M13	26	81	7	-	114
M14	21	37	-	10	68
M15	16	54	1	-	71
M16	15	33	16	-	64
M17	12	28	-	-	40
M18	14	14	-	-	28
M19	6	13	-	-	19

B11 employed the highest number of personnel in each category: 187 clerical, 779 maintenance, and 229 aides.

Table 11 summarizes the results of Tables 3, 7 to 10 and shows the total staff employed by each of the twenty-one school systems in three major metropolitan regions in Western Canada. The total staff ranges from a low of 186 for system M19 to a high of 4,315 for system B11. Thus, the total staff figure includes all support personnel as well as all teachers, administrators, and central office auxiliary personnel.

Administrative, Central Office, Support, Non-instructional, and Instructional Ratios

Comparison of the numbers of personnel in the various components of school systems is rather meaningless because of large variations among system sizes. Thus, three measures of system size (total staff, total number of schools, and total number of pupils) were used to develop ratios which indicated the proportions of staff within the various components of each system. Ratios of total administrative, total central office, total support, total non-instructional, and total instructional staff to the three measures of system size are expressed in Tables 12 to 16. In each table the first ratio was formed by dividing the total number of staff in the respective component by the total staff and multiplying by 100. This essentially expressed the ratio as a percentage of total staff and is used with this meaning throughout the thesis. The second and third ratios were respectively obtained by determining the quotient between the number of staff members and (1) the number of schools in the system; and,

Table 11

Summary of Total Staff Employed by School Systems

School system identifier	Instructional staff	C.O. admin- istrative staff	C.O. auxiliary staff	C.O. support staff	In-school administrative staff	In-school support staff	Total staff
B11	2784.8	63	74	415	183.2	795	4315
B12	1139.6	18	49	54	82.4	313	1656
B13	1081.5	22	7	111	59.5	302	1583
B14	883.4	21	6	50	54.6	205	1220
B15	876.0	19	41	52	51.0	219	1258
B16	607.0	13	30	42	34.0	118	844
B17	390.7	11	3	40	18.3	79	542
B18	344.2	11	16	31	28.8	100	531
B19	242.2	10	4	21	14.8	60	352
B21	1264.8	38	36	126	46.2	284	1795
B22	221.1	10	1	19	11.9	58	321
B23	214.4	10	1	21	10.6	46	303
M11	2043.0	70	65	240	128.0	607	3153
M12	857.2	21	13	40	42.8	142	1116
M13	517.5	13	7	51	31.5	114	734
M14	259.3	10	5	11	16.7	40	342
M15	319.5	7	7	6	22.5	71	433
M16	268.0	11	6	26	21.0	64	396
M17	342.5	11	7	17	22.5	68	468
M18	157.5	12	2	7	6.5	28	213
M19	139.6	8	2	8	9.4	19	186

Table 12

Ratios of Total Administrative Staff to Three
Measures of System Size

School system identifier	Total admin. staff ^a	Total admin. staff per 100 staff	Total admin. staff per school	Total admin. staff per 1000 pupils
B11	246.2	5.71	2.22	3.28
B12	100.4	6.06	2.01	3.45
B13	81.5	5.15	1.10	2.96
B14	75.6	6.20	1.61	3.16
B15	70.0	5.56	1.56	3.24
B16	47.0	5.57	1.12	2.96
B17	29.3	5.41	1.33	3.02
B18	36.9	6.95	2.31	4.52
B19	24.8	7.05	2.76	4.03
B21	84.2	4.69	1.48	2.59
B22	21.9	6.82	1.15	3.46
B23	20.6	6.80	1.14	4.12
M11	198.0	6.28	2.41	4.12
M12	63.8	5.72	1.82	3.32
M13	44.5	6.06	1.85	3.56
M14	33.5	7.16	2.39	3.85
M15	29.5	6.81	1.97	4.20
M16	32.0	8.08	1.88	4.72
M17	26.7	7.81	2.43	4.36
M18	18.5	8.69	2.06	4.94
M19	17.4	9.35	2.90	5.74

^aTotal administrative staff is obtained from Tables 7
and 9.

Table 13
 Ratios of Total Central Office Staff to Three
 Measures of System Size

School system identifier	Total C.O. staff ^a	Total C.O. staff per 100 staff	Total C.O. staff per school	Total C.O. staff per 1000 pupils
B11	552	12.79	4.97	7.36
B12	121	7.31	2.42	4.16
B13	140	8.84	1.89	5.08
B14	77	6.31	1.64	3.22
B15	112	8.90	2.49	5.19
B16	85	10.07	2.02	5.36
B17	54	9.96	2.45	5.57
B18	58	10.92	3.63	7.10
B19	35	9.94	3.89	5.69
B21	200	11.14	3.51	6.16
B22	30	9.35	1.58	4.74
B23	32	10.56	1.78	6.40
M11	375	11.89	4.57	7.80
M12	74	6.63	2.11	3.85
M13	79	10.76	3.29	6.33
M14	35	7.48	2.50	4.03
M15	20	4.62	1.33	2.85
M16	43	10.86	2.53	6.35
M17	26	7.60	2.36	4.24
M18	21	9.86	2.33	5.61
M19	18	9.68	3.00	5.93

^aTotal central office staff is obtained from Tables 7 and 8.

Table 14
Ratios of Total Support Staff to Three Measures
of System Size

School system identifier	Total support staff ^a	Total support staff per 100 staff	Total support staff per school	Total support staff per 1000 pupils
B11	1210	28.04	10.90	16.13
B12	367	22.16	7.34	12.62
B13	413	26.09	5.58	14.99
B14	255	20.90	5.43	10.65
B15	271	21.54	6.02	12.55
B16	160	18.96	3.81	10.09
B17	119	21.96	5.41	12.26
B18	131	24.67	8.19	16.03
B19	81	23.01	9.00	13.16
B21	410	22.84	7.19	12.63
B22	77	23.99	4.05	12.18
B23	67	22.11	3.72	13.40
M11	847	26.86	10.33	17.61
M12	182	16.31	5.20	9.48
M13	165	22.48	6.88	13.22
M14	85	18.16	6.07	9.78
M15	77	17.78	5.13	10.97
M16	90	22.73	5.29	13.29
M17	51	14.91	4.64	8.32
M18	35	16.43	3.89	9.35
M19	27	14.52	4.50	8.90

^aTotal support staff is obtained from Tables 8 and 10.

Table 15
 Ratios of Total Non-instructional Staff to Three
 Measures of System Size

School system identifier	Total non- instructional staff ^a	Total non- instructional staff per 100 staff	Total non- instructional staff per school	Total non- instructional staff per 1000 pupils
B11	1530.2	35.46	13.79	20.40
B12	516.4	31.18	10.33	17.76
B13	501.5	31.68	6.78	18.20
B14	336.6	27.59	7.16	14.06
B15	382.0	30.37	8.49	17.69
B16	237.0	28.08	5.64	14.95
B17	151.3	27.92	6.88	15.59
B18	183.9	34.63	11.49	22.50
B19	109.8	31.19	12.20	17.84
B21	530.2	29.54	9.30	16.33
B22	99.9	31.12	5.26	15.80
B23	88.6	29.24	4.92	17.72
M11	1110.0	35.20	13.54	23.07
M12	258.8	23.19	7.39	13.47
M13	224.5	30.59	9.35	17.98
M14	125.5	26.82	8.96	14.44
M15	113.5	26.21	7.57	16.18
M16	128.0	32.32	7.53	18.90
M17	82.7	24.18	7.52	13.49
M18	55.5	26.06	6.17	14.82
M19	46.4	24.95	7.73	15.29

^aTotal non-instructional staff includes all central office personnel, in-school administrators, and in-school support personnel. The numbers for each component are obtained from Table 11.

Table 16
 Ratios of Total Instructional Staff to
 Three Measures of System Size

School system identifier	Total instructional staff ^a	Total instructional staff per 100 staff	Total instructional staff per school	Total instructional staff per 1000 pupils
B11	2784.8	64.54	25.09	37.13
B12	1139.6	68.82	22.79	39.18
B13	1081.5	68.32	14.61	39.25
B14	883.4	72.41	18.80	36.90
B15	876.0	69.63	19.47	40.57
B16	607.0	71.92	14.45	38.29
B17	380.7	72.08	17.76	40.27
B18	347.1	65.37	21.69	42.47
B19	242.2	68.81	26.91	39.36
B21	1264.8	70.46	22.10	38.95
B22	221.1	68.88	11.64	34.96
B23	214.4	70.76	11.91	42.87
M11	2043.0	64.80	24.91	42.47
M12	857.2	76.81	24.49	44.63
M13	517.5	70.50	21.56	41.46
M14	342.5	73.18	24.46	39.39
M15	319.5	73.79	21.30	45.54
M16	268.0	67.68	15.76	39.56
M17	259.3	75.82	23.57	42.31
M18	157.5	73.94	17.50	42.06
M19	139.6	75.05	23.27	46.01

^aTotal instructional staff is obtained from Table 11.

(2) by the number of pupils divided by 1000 (per 1000 pupils). Hence, each ratio expresses the proportion of staff in that component relative to system size.

STATISTICAL ANALYSIS OF THE DATA

The Pearson product moment correlation was used to examine what relationships existed between size of school systems and the percentages of staff in the administrative, central office, support, non-instructional, and instructional components. Ferguson (1966:106) writes that variables must be quantitative, that is, of the interval or ratio type in order for the Pearson r to be calculated. This essential criterion was satisfied by the variables employed in this study; therefore they were suited to a correlation test of this type.

Description of Seven Intercorrelated Variables

Variable 1: number of total staff. Total staff refers to the number of all administrative, auxiliary, and support personnel located in schools and in the central office (Table 11).

Variable 2: number of schools. The total number of schools in a school system from primary-elementary to senior high inclusive, was categorized here and recorded in Table 3. Schools operated by school systems which were primarily post-secondary in nature were excluded.

Variable 3: number of pupils. This variable measured the total number of pupils in all grades in a school system from kindergarten to senior high inclusive (Table 3).

Variable 4: percentage of staff in administrative positions.

This was the ratio of the total number of administrative staff to the size of the school system in terms of total staff (Variable 1), expressed as a percentage. Percentages for each school system are contained in Table 12.

Variable 5: percentage of staff in central office. In this

variable, the ratio of the total central office staff to the total staff was expressed as a percentage (Table 13).

Variable 6: percentage of staff in support positions. The

percentage that the sum of the numbers of central office and in-school support staff was of the total staff employed by a school system (Table 14) formed this variable.

Variable 7: percentage of staff in non-instructional posi-

tions. This variable expressed all non-instructional personnel in a school system as a percentage of total staff. Ratios for this variable are listed in Table 15.

Pearson Product Moment Intercorrelation Matrix

A Pearson product moment intercorrelation matrix was obtained as shown in Table 17. Correlation figures in this table were used in examining twelve of the subproblems posed in Chapter 2.

Since the sample in this study was not randomly chosen, the correlations obtained were used in a descriptive sense; hence, generalizations to other school systems were not made. Therefore, the probability levels of significance for each Pearson r were not

Table 17

Pearson Product Moment Intercorrelation Matrix
for Seven Continuous Variables

Variable	1	2	3	4	5	6	7
	Total staff	No. of schools	No. of pupils	Admin. staff as % of total staff	C.O. staff as % of total staff	Support staff as % of total staff	Non-instructional staff as % of total staff
1	1.00	0.91	0.95	-0.49	0.36	0.59	0.54
2		1.00	0.92	-0.61	0.31	0.61	0.52
3			1.00	-0.51	0.34	0.58	0.52
4				1.00	-0.05	-0.50	-0.28
5					1.00	0.55	0.62
6						1.00	0.89
7							1.00

reported in the intercorrelation matrix. This necessitated the selection of a minimum correlation coefficient which would be considered to indicate a high degree of association between two variables, that is, a "significant" relationship. Thorndike and Hagen (1961:119) state that at a correlation of $+0.30$, "you can see a barely perceptible trend for the points to group in the low-low and high-high direction." They also write that the trend becomes more marked as the correlation increases in absolute value. For the purposes of this study a Pearson r of $|0.40|$ was considered to indicate a high degree of association and a significant relationship between the two variables.

Examination of Subproblems 1, 2, and 3

Subproblem 1: What relationship exists between the percentage of personnel in administrative positions and the total staff in a school system?

Subproblem 2: What relationship exists between the percentage of personnel in administrative positions and the total number of schools in a school system?

Subproblem 3: What relationship exists between the percentage of personnel in administrative positions and the total number of pupils in a school system?

The Pearson correlation coefficient between the percentage of staff in administrative positions in a school system and (a) the total staff was -0.49 , (b) the total number of schools was -0.61 , and (c) the total number of pupils was -0.58 . These were all considered high negative correlations.

Discussion. The results of examining subproblems 1, 2, and 3 revealed that for the twenty-one school systems in three major metropolitan areas in Western Canada, the percentage of staff in administrative positions was inversely related to the total staff in the school system, the total number of schools in the school system, and the total number of pupils in the school system. These findings reinforce those of Gill (1967:46), Blowers (1969:67), and Vithayathil (1969:74) even though a different procedure for determining the number of in-school administrative personnel was utilized in this study.

Examination of Subproblems 4, 5, and 6

Subproblem 4: What relationship exists between the percentage of personnel in the central office and the total staff in a school system?

Subproblem 5: What relationship exists between the percentage of personnel in the central office and the total number of schools in a school system?

Subproblem 6: What relationship exists between the percentage of personnel in the central office and the total number of pupils in a school system?

The Pearson product moment correlation coefficient between the percentage of staff in central office positions in school systems and (a) their total staff was 0.36, (b) their total number of schools was 0.31, and (c) their total number of pupils was 0.34. These correlation coefficients indicated that a small, positive relationship existed between the percentages of total staff that were centrally

located in each of the twenty-one school systems and various measures of system size.

Discussion. The present findings can be compared with those of Carter (1968:55) who showed that larger ratios of total central office staff per 1,000 pupils were associated with smaller systems and that correspondingly smaller ratios were associated with school systems that increased in size to approximately 12,000 students. However, Carter also found that increasingly larger central office ratios tend to characterize systems that are comprised of more than 12,000 students. In the current study, ten of the twenty-one school systems investigated contained more, and eleven contained less, than 12,000 students. Furthermore, eight of the eleven were in the 6,001 - 12,000 category that Carter used, and of the ten systems containing more than 12,000 students, seven had more than 20,000 students. Thus, since the systems considered in this research were generally larger than Carter's, a small positive correlation could have been expected. Moreover, Carter did not include custodians and plant operation and maintenance personnel in his central office component. The inclusion of these personnel may have further supplemented the positive correlation that would likely have formed.

Examination of Subproblems 7, 8, and 9

Subproblem 7: What relationship exists between the percentage of staff in support positions and the total staff in a school system?

Subproblem 8: What relationship exists between the percentage of staff in support positions and the total number of schools in a system?

Subproblem 9: What relationship exists between the percentage of staff in support positions and the total number of pupils in a system?

The Pearson r between the percentage of staff in support positions in school systems and (a) their total staff was 0.59, (b) their total number of schools was 0.62, and (c) their total number of pupils was 0.58. These results indicated that for the twenty-one school systems in this study, a significant positive correlation existed between the percentage of staff in support positions and the total staff in a school system, the total number of schools in a school system, and the total number of pupils in a school system.

Discussion. These results further reinforce the earlier statements regarding the apparent agreement between Carter's findings and those of this study concerning ratios of central office staff to various measures of system size.

Examination of Subproblems 10, 11, and 12

Subproblem 10: What relationship exists between the percentage of staff in non-instructional positions and the total staff in a school system?

Subproblem 11: What relationship exists between the percentage of staff in non-instructional positions and the total number of schools in a school system?

Subproblem 12: What relationship exists between the percentage of staff in non-instructional positions and the total number of pupils in a school system?

The Pearson correlation coefficient which related the percentage of staff in non-instructional positions in school systems to (a) their total staff was 0.54, (b) their total number of schools was 0.52, and (c) their total number of pupils was 0.52. These findings showed that there was a tendency for the percentage of staff in non-instructional positions to be directly related to each measure of system size.

Discussion. Just as in the study by Haas, Hall, and Johnson (1963:13), this study also dichotomized all organizational personnel into those who were "directly" involved with classroom instruction and those who were "indirectly" involved. The former was labelled as the "instructional" component and the latter as the "non-instructional" component. Haas, Hall, and Johnson preferred to refer to the staff in the second category as "supportive personnel." However, the results from the examination of subproblems 10, 11, and 12 contradict the findings of Haas, Hall, and Johnson; that is, increasingly larger percentages of staff in non-instructional (or supportive) components tend to be associated with larger school systems. For all thirty organizations studied, Haas, Hall, and Johnson reported inverse relationships between the size of the organization and the size of that organization's supportive component. One factor concerning the latter study must be re-emphasized--only one of the thirty organizations studied by Haas, Hall, and Johnson was educational in nature, and that was a small, private denominational university.

Examination of Subproblems 13, 14, and 15

Subproblem 13: What differences exist among the mean percentages of personnel in the administrative, central office, support, non-instructional, and instructional components in groups of school systems of different sizes?

Subproblem 14: What differences exist among the mean numbers of personnel per school in the administrative, central office, support, non-instructional, and instructional components in groups of school systems of different sizes?

Subproblem 15: What differences exist among the mean numbers of personnel per 1000 pupils in the administrative, central office, support, non-instructional, and instructional components in groups of school systems of different sizes?

In order to compare the administrative, central office, support, non-instructional, and instructional ratios pertaining to smaller systems in the metro areas with those of larger systems, the twenty-one school systems were categorized into four groups based on their total number of pupils. Group 1 consisted of eight small school systems whose size ranged from 3,034 to 7,016 pupils; Group 2 was comprised of five medium-sized school systems in the size range 8,173 to 15,853 pupils; Group 3 included six large school systems ranging in size from 19,208 to 32,470 pupils; and Group 4 was composed of two very large school systems whose sizes were 48,106 and 75,007 pupils. On this basis mean ratios for each component were obtained by determining the quotient between the total number of personnel in that component for all systems in the group and three measures of total group size (Table 18). This was done in order to obtain more representative means for each group.

Table 18

Mean Numbers of Staff for Various Components in Groups of School Systems

Group	No. of school systems in the group	Size range of group (number of pupils)	Administration	Central office	Support	Non-instructional	Instructional
Mean number of staff per 100 staff (percentage of total staff)							
1	8	3,034-7,016	7.52	8.84	19.84	28.45	71.55
2	5	8,173-15,853	6.13	9.97	21.16	29.27	70.69
3	6	19,208-32,470	5.51	8.39	22.00	29.57	70.73
4	2	48,106-75,007	5.95	12.41	27.54	35.35	64.65
Mean number of staff per school							
1	8	3,034-7,016	1.84	2.16	4.86	6.97	17.52
2	5	8,173-15,853	1.62	2.64	5.59	7.82	18.68
3	6	19,208-32,470	1.54	2.35	6.16	8.20	19.81
4	2	48,106-75,007	2.30	4.80	10.66	13.68	25.01
Mean number of staff per 1000 pupils							
1	8	3,034-7,016	4.33	5.09	11.43	16.40	41.24
2	5	8,173-15,853	3.48	5.66	12.02	16.80	40.16
3	6	19,208-32,470	3.09	4.71	12.34	16.42	39.66
4	2	48,106-75,007	3.61	7.53	16.71	21.45	39.21

Mean administrative ratios. High negative correlations between the percentage of staff in administrative positions and (1) the total staff, (2) the total number of schools, and (3) the total number of pupils in a school system were reported earlier. Inspection of the mean administrative ratios that were developed for each group and shown in Table 18 indicated that smaller systems had higher mean administrative ratios than did larger systems. However, this relationship appeared to be curvilinear since the mean percentage of administrative staff, the mean number of administrative staff per school, and the mean number of administrative staff per 1000 pupils were all substantially higher for Group 4 (comprised of very large systems) than for Group 3.

Discussion. The curvilinear relationships that were found to exist between the proportion of administrative staff and various measures of school system size were in general agreement with the findings of Gill, Blowers, and Vithayathil. Both Gill (1967:46-49) and Blowers (1969:86-93) established that the relationships between the various measures of system size and the percentages of staff in administrative positions were logarithmic, curvilinear, and asymptotic. However, neither found that the proportion of total administrative staff increased for the group composed of the largest systems. On the other hand, Vithayathil (1969:53-54) concluded that the mean percentage of staff in administrative positions tended to increase for groups comprised of large systems and that the mean number of administrative staff per school also was larger for groups of large school systems than for groups of small systems.

The results of this study and those of Blowers, Gill, Vithayathil, and Carter seem to indicate that a minimum point exists on the curvilinear relationship between the proportion of staff in administrative positions and the total staff within a system. In other words, should this relationship be graphed for systems of different sizes, the coordinates of the point at the minimum would represent the lowest administrative ratio obtained and the size of a school district at which this ratio is realized.

Table 19 shows that Group 4 had a higher percentage of staff in both central office and in-school administrative positions than did Group 3; moreover, Group 4 (Table 20) also had higher mean proportions of staff per 1000 pupils in both central office and in-school administrative positions than did Group 3. Further, only in the ratios of central office senior administrative staff is there a definite decrease in ratios associated with Group 1 to Group 4.

In summary, a significant negative correlation existed between the administrative component and school system size, but the large systems in this study were characterized by larger administrative ratios at the central office, school, and system levels than were groups of slightly smaller systems.

Mean central office ratios. The three sets of mean central office ratios in Table 18 suggest that there is a general tendency for larger central office components to be associated with larger school systems. Although distinct differences are not readily apparent among Groups 1, 2, and 3, the mean ratio for the systems in Group 4 is clearly above the first three. This relationship was graphed in Figures 1, 2, and 3 to make the differences more evident.

Table 19

Mean Percentages of Staff Comprising the Non-instructional Component in Groups of School Systems of Different Sizes

Group		Mean percentage of staff in each non-instructional component														
No. of school systems in the group	Size range of group (number of pupils)	C.O. senior admin.	C.O. intermediate admin.	C.O. supervisory admin.	C.O. service admin.	Total C.O. admin.	In-school admin.	C.O. auxiliary (pupil-oriented)	C.O. auxiliary (specialists)	Total C.O. auxiliary	C.O. clerical	C.O. support	In-school support	In-school clerical	In-school aides	
1	8 3,034-7,016	0.75	0.43	1.41	0.47	3.06	4.45	1.02	0.08	1.10	1.69	4.67	15.16	4.16	1.02	
2	5 8,173-15,853	0.45	0.51	0.42	0.51	1.89	4.24	1.89	0.13	2.02	1.76	5.80	15.36	4.33	1.09	
3	6 19,208-32,470	0.20	0.45	0.66	0.30	1.61	3.90	1.59	0.17	1.76	1.74	5.02	16.98	4.98	2.12	
4	2 48,106-75,007	0.16	0.37	0.83	0.42	1.78	4.17	1.66	0.20	1.86	2.36	8.77	18.77	4.49	4.77	

Table 20

Mean Number of Personnel per 1000 Pupils for the Non-instructional Component
in Groups of School Systems of Different Sizes

Group No. of school systems in the group	Size range of group (number of pupils)	Mean number of staff in each non-instructional component											
		C.O. senior admin.	C.O. intermediate admin.	C.O. supervisory admin.	C.O. service admin.	Total C.O. admin.	In-school admin.	C.O. auxiliary (pupil-oriented)	C.O. auxiliary (specialists)	Total C.O. auxiliary	C.O. clerical	C.O. support	In-school support
1	8 3,034-7,016	0.43	0.25	0.81	0.27	1.77	2.57	0.59	0.05	0.63	0.97	2.69	8.74
2	5 8,173-15,853	0.25	0.29	0.24	0.29	1.07	2.41	1.07	0.07	1.15	1.00	3.30	8.72
3	6 19,208-32,470	0.11	0.25	0.37	0.17	0.90	2.19	0.89	0.10	0.99	0.97	2.81	9.52
4	2 48,106-75,007	0.10	0.23	0.50	0.25	1.08	2.53	1.01	0.12	1.13	1.43	5.32	11.39
													2.72
													2.89
													0.59
													0.62
													1.19
													2.79
													2.89

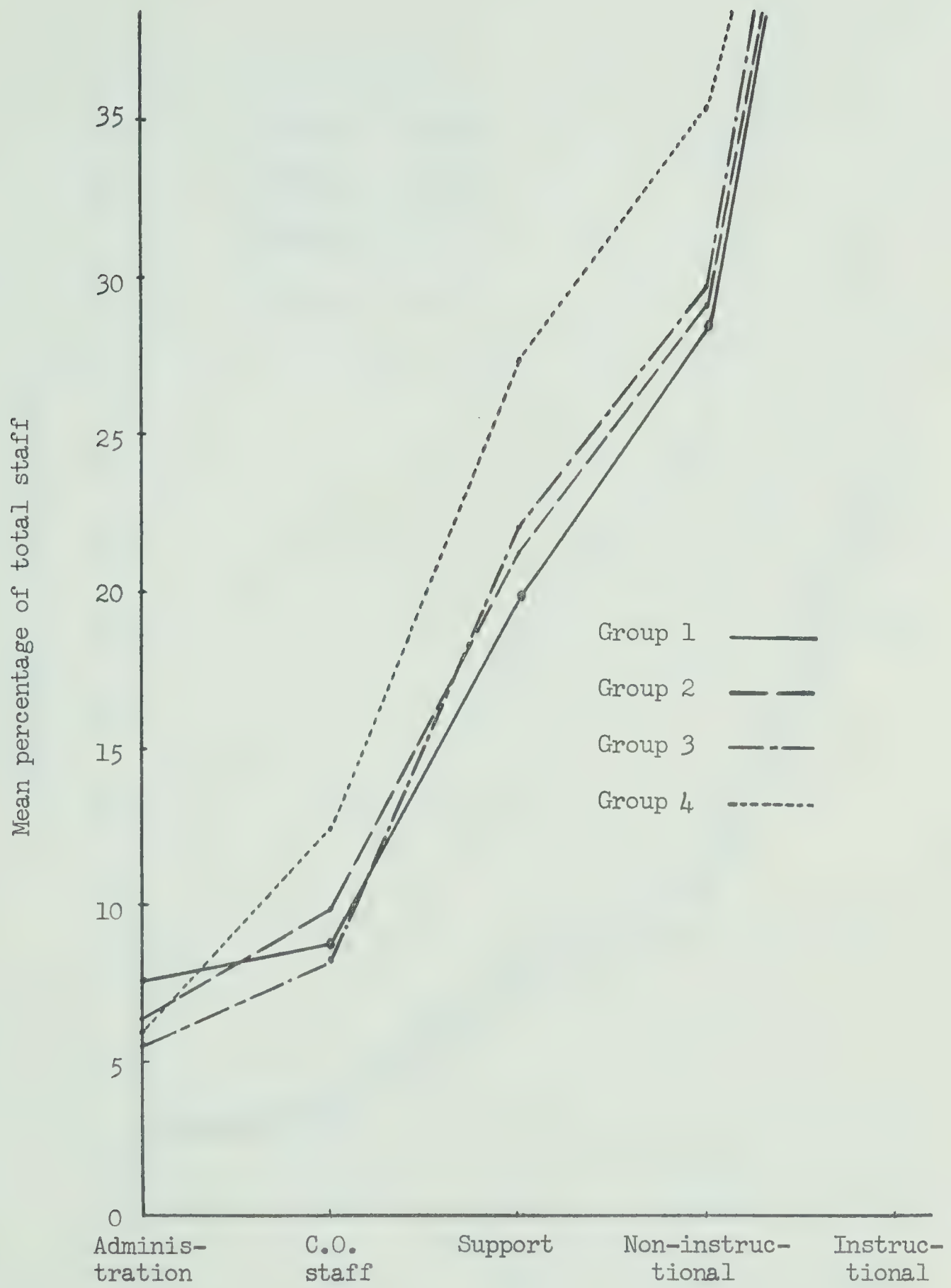


Figure 1

Profiles of the Mean Number of Staff per 100 Total Staff (Mean Percentage of Total Staff) for Various Components in Groups of School Systems of Different Sizes

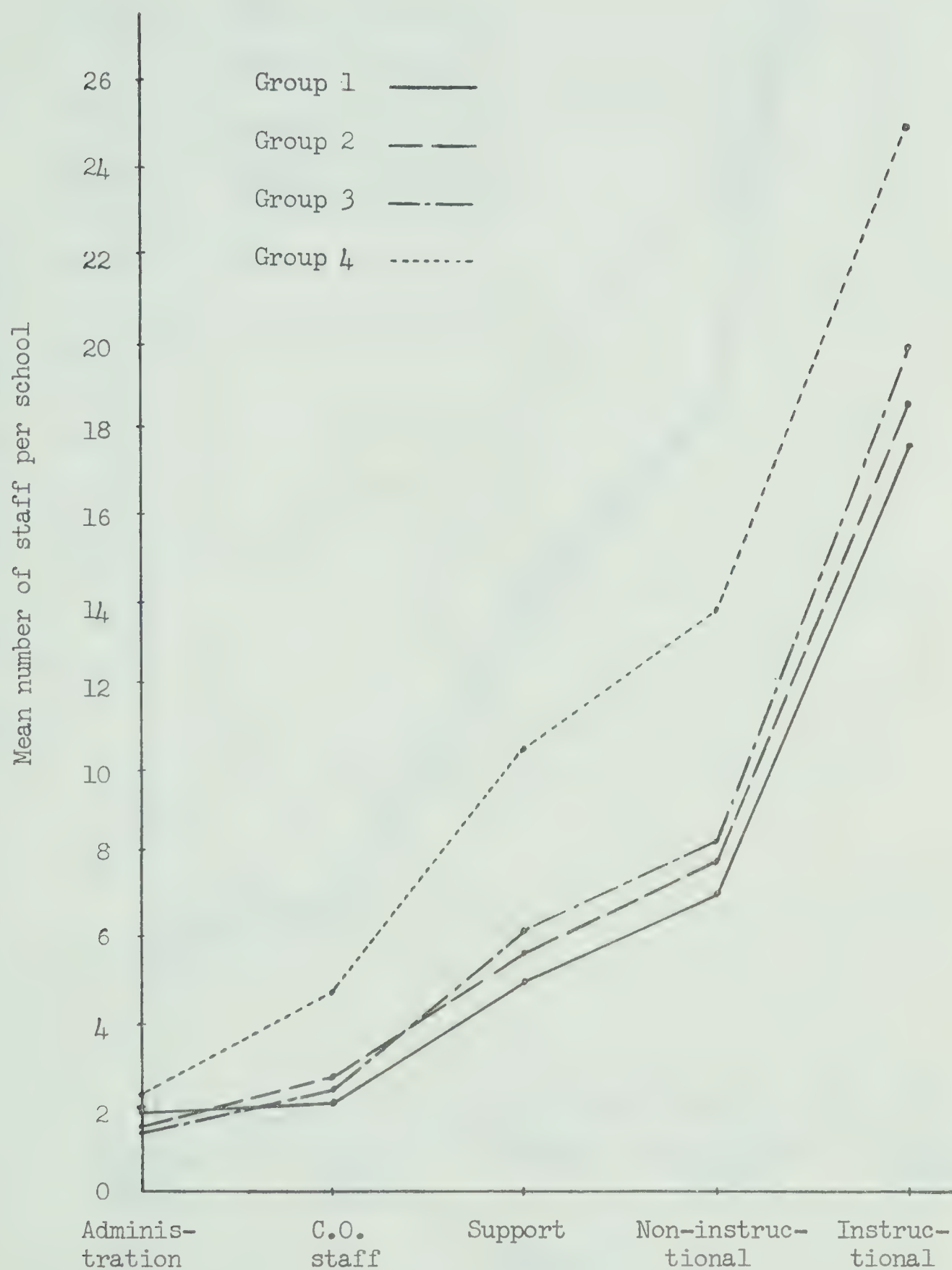


Figure 2

Profiles of the Mean Number of Staff per School for Various
Components in Groups of School Systems
of Different Sizes

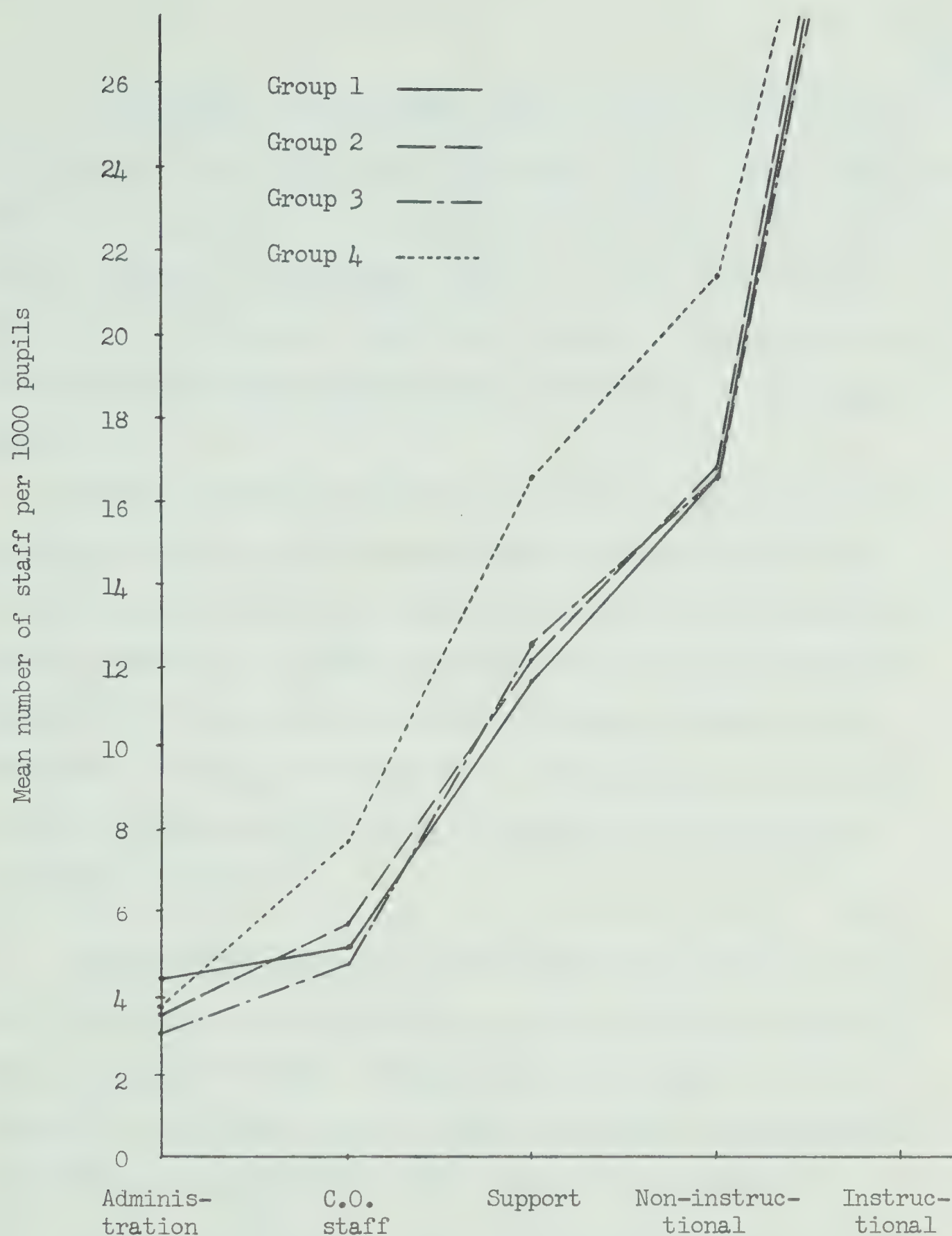


Figure 3

Profiles of the Mean Number of Staff per 1000 Pupils for
Various Components in Groups of School Systems
of Different Sizes

Discussion. The large mean central office ratio for Group 4, which was comprised of two very large systems, may have been responsible for the small but definitely positive correlation that was previously obtained between the percentage of staff in central office and the total staff. Furthermore, these results agree with those of Carter--larger central office ratios tend to be associated with very large systems.

Tables 19 and 20 indicate that mean ratios for the central office auxiliary and central office support components tend to be larger in groups comprised of larger systems. With the exception of systems in Group 4, the ratios for the central office administrative component tend to be smaller for groups of larger systems. Only the central office auxiliary specialist component shows a continuous increase in mean ratios per 100 staff members and per 1000 pupils for Groups 1 through 4.

Mean support ratios. The mean ratios of the number of support staff per 100 total staff, per school, and per 1000 pupils were successively larger for Group 1 through Group 4 as shown in Table 18. Figures 1, 2, and 3 also clearly reveal that larger support ratios are associated with groups consisting of larger school systems.

Discussion. The mean ratios of in-school support, in-school clerical, and in-school aides components per 100 staff and per 1000 pupils (Tables 19 and 20) were smallest for the group comprised of the smallest school systems and were progressively larger for each group containing larger school systems. The same ratios calculated

for central office support and central office clerical components also showed a marked tendency to be larger for groups of larger systems. The present findings were in agreement with those of Haire (1959:297) who reported that the number of clerical workers in organizations increases steadily as the company grows.

Mean non-instructional ratios. Irrespective of the measure used to describe system size, the ratios calculated for the non-instructional component were larger for groups composed of larger school systems (Table 18). This observation was expected because of the high positive correlation obtained earlier for the relationship between the size of the non-instructional component and system size. The large variations in non-instructional ratios among the four groups are readily apparent in Figures 1, 2, and 3.

Discussion. These results further disagree with those of Haas, Hall, and Johnson, because much larger non-instructional or "supportive" ratios were found to be associated with groups containing large rather than small school systems.

Indik's observation (1965:309), that his results contrasted with those of Terrien and Mills because the latter included support personnel in the calculation of their ratios, was substantiated by the results of the present study. That is, non-instructional ratios were found to be consistently higher for groups comprised of larger systems. This finding is in agreement with the results of Terrien and Mills since both the non-instructional component presently investigated and the administrative component as defined by Terrien and Mills consisted of administrative as well as support personnel.

Mean instructional ratios. The only prominent difference among the ratios of the instructional component to three measures of system size (Table 18) for the four groups of school systems is that both the mean percentage of total staff employed in this component and the mean number of instructional staff per 1000 pupils is lowest for Group 4 (group comprised of the largest systems) and highest for Group 1 (group comprised of smallest systems).

Discussion. One possible explanation for the lower instructional ratios for Group 4 is that the large school systems employ a higher proportion of non-instructional personnel such as teacher aides, technicians, specialists, and clerical personnel than do the smaller systems. This tendency would result in higher non-instructional ratios and lower instructional ratios for the group containing large school systems.

Summary of Chapter 4

For the twenty-one systems in three major metropolitan areas in Western Canada, the percentages of staff in administrative positions tended to be higher in smaller systems, and lower in larger systems, irrespective of the measure used to indicate system size.

The examination of Subproblems 4, 5, and 6 showed that the percentages of staff in the central offices of the twenty-one school systems investigated was positively, but not highly correlated to any measure of system size.

Evidence obtained from examining subproblems 7, 8, and 9 revealed that there were significant positive correlations between the

percentages of staff in support positions and the total staff, the total number of schools, and the total number of pupils in a school system.

High positive correlations were also obtained between the percentage of staff in non-instructional positions and the total staff, the total number of schools, and the total number of pupils in each of the twenty-one school systems studied.

To facilitate a closer examination of the ratios of various components among small and large systems, the twenty-one school systems were categorized into four groups according to their number of pupils. The smallest systems were placed in Group 1; each successive group then contained larger systems. An examination of the mean ratios which were developed produced the following findings: (1) mean administrative ratios were successively smaller for Groups 1 to 3 but larger for Group 4 than for Group 3; (2) mean central office ratios exhibited a tendency to be larger for groups of larger school systems, however, available evidence was inconclusive; (3) mean support ratios were progressively higher for Groups 1 through 4; (4) mean non-instructional ratios were higher for groups composed of larger systems; (5) the mean instructional ratios were always lowest for the group containing very large systems; (6) successively lower mean ratios for central office senior administrators were associated with groups comprised of larger school systems; and (7) the mean ratios for in-school aides, in-school clerical, and in-school support components were continually larger for Groups 1 through 4.

Chapter 5

PRESENTATION AND ANALYSIS OF DATA PERTAINING TO THE COSTS OF VARIOUS COMPONENTS

The purpose of the data presented and the statistical analysis employed in this chapter was to relate the costs of the administrative, central office, support, non-instructional, and instructional components of school systems to three measures of school system size. The costs attributed to each component were the total gross salaries of all personnel in that component.

PRESENTATION OF THE DATA

Raw Data

Table 21 shows the costs in terms of total gross salaries for the central office administrative, central office auxiliary, and central office support personnel employed in each of the twenty-one school systems in this study.

For those school systems in which the administrative and support personnel in central offices were paid on a calendar-year basis, the total gross salaries were prorated to obtain a cost figure for the 1969-70 school year. This was accomplished by summing one-third of the total gross salaries paid to staff in that component during the 1969 calendar year with two-thirds of the total gross salaries paid to staff in that component during the 1970 calendar year.

Table 21

Total Gross Salaries (Cost) of Central Office Administrative,
Auxiliary, and Support Personnel

School system identifier	Total gross salaries of C.O. administrative personnel	Total gross salaries of C.O. auxiliary personnel	Total gross salaries of C.O. support personnel
B11	1,024,450	915,490	2,254,690
B12	282,160	493,645	465,150
B13	215,800	72,850	691,800
B14	332,060	64,580	336,800
B15	289,180	371,670	314,280
B16	180,050	292,750	269,960
B17	155,910	31,600	279,900
B18	130,040	159,840	195,020
B19	126,500	36,500	137,920
B21	496,750	361,680	778,900
B22	92,270	5,860	104,940
B23	95,210	5,370	127,030
M11	964,360	770,030	1,740,120
M12	277,000	122,800	201,000
M13	155,710	65,630	249,490
M14	123,260	46,000	79,960
M15	76,100	52,500	26,100
M16	141,145	51,550	80,790
M17	114,520	38,300	53,610
M18	84,250	12,900	31,700
M19	90,400	26,800	37,700

The total gross salaries of central office auxiliary personnel were estimated in the following manner. First, the total gross salaries of those auxiliary staff members actually located in the central office were found. Second, the contribution by the school system to a health services organization was taken as the total gross salaries of these personnel. Finally, the two figures were summed to yield the total central office auxiliary cost. This cost was then prorated for the 1969-70 school year. A substantial error may exist between the financial contribution by a system to a health organization and the actual total gross salaries of personnel whose services were obtained; however, since costs incurred by the system were to be related to operational expenditures, no other feasible alternative was available.

Superintendents or other officials of each school system provided data pertaining to the total gross salaries and the total gross allowances received by principals, assistant principals, head teachers, subject coordinators, department heads, business managers, et cetera, for each type of school. An estimated average percentage of time spent by the same administrators in non-teaching duties in each type of school was also provided (Questionnaire in Appendix A). To obtain the cost of the in-school administrative staff, Percevault's (1964:17-18) technique was utilized, that is, the basic gross salaries (total gross salaries - total gross allowances) were prorated according to the estimated percentage of time spent in non-teaching duties and then summed with the total gross allowances paid to all staff in that respective administrative position. Specifically, the formula used was $[(A - B)C] + B = D$, where A was the total gross salaries of all

staff in that administrative position, B represented the total gross allowances of all staff in that administrative position, C referred to the estimated percentage of time spent by staff in that administrative position in non-teaching duties, and D represented the administrative cost.

The above formula was applied for each administrative position in each type of school. Data and complete analysis of the total gross salaries and allowances, and estimated percentages of time spent by administrators in non-teaching duties is presented in Appendix B. The actual total cost of in-school administrative staff charged to each type of school in each of the twenty-one school systems is shown in Table 22.

The total cost of in-school support staff in each school system is shown in Table 23. This cost consisted of the total gross salaries paid to all clerical, plant operation and maintenance, and cafeteria personnel employed by a school system.

STATISTICAL ANALYSIS OF THE DATA

Cost Ratios of Various Components

To facilitate the comparison of administrative, central office, support, non-instructional, and instructional costs of different school systems, three separate cost ratios were determined: (1) total cost of that component per staff member; (2) total cost of that component per school; and (3) total cost of that component per pupil. Total costs and corresponding ratios for each component are reported for all school systems in Tables 24 to 28.

Table 22

Cost of In-school Administrative Staff for Various Types of Schools^a

School system identifier	Elementary	Junior high	Senior high	Elementary-junior high	Junior-senior high	Other	Total
B11	1,675,690	-	-	-	1,377,870	-	3,053,560
B12	791,570	355,760	215,710	-	62,680	-	1,425,720
B13	558,630	304,050	177,690	-	-	-	1,040,370
B14	566,270	257,680	95,860	-	46,540	11,030	977,380
B15	515,140	157,070	139,900	-	219,920	-	1,032,030
B16	375,700	183,080	84,050	-	-	-	642,830
B17	196,670	50,450	-	-	104,740	-	351,860
B18	247,700	-	-	-	236,850	-	484,550
B19	165,450	-	-	100,500	-	-	265,950
B21	358,450	255,600	197,600	20,390	35,490	52,270	919,800
B22	97,090	40,930	22,530	10,580	19,360	970	191,460
B23	106,470	55,580	22,900	-	-	-	185,040
M11	908,390	207,160	332,200	195,860	462,750	-	2,106,640
M12*	310,500*	131,900*	183,750*	52,250*	-	-	678,400*
M13	176,390	88,550	132,780	36,440	-	17,350	451,510
M14	142,630	57,380	30,900	51,820	31,200	-	313,930
M15	61,280	-	93,480	138,670	-	-	293,430
M16	94,040	53,330	79,070	21,500	-	-	247,940
M17	95,950	-	42,210	62,470	33,870	-	234,500
M18	15,140	-	28,330	47,030	-	-	90,500
M19	28,980	-	31,140	40,180	-	23,290	123,590

^aComplete analysis of the in-school administrative costs for each type of school in each school system is provided in Appendix B.

* Projected figures.

Table 23

Total Gross Salaries (Cost) of In-school Support Staff

School system identifier	Total gross salaries of in-school support personnel	School system identifier	Total gross salaries of in-school support personnel
B11	3,995,120	M11	3,286,600
B12	1,651,846	M12	750,000
B13	1,540,460	M13	427,440
B14	1,082,125	M14	420,080
B15	1,603,670	M15	251,280
B16	738,400	M16	200,680
B17	431,820	M17	234,500
B18	563,000	M18	129,440
B19	331,830	M19	82,450
B21	1,507,080		
B22	278,650		
B23	247,724		

Table 24
 Ratios of Administrative Cost to Three
 Measures of System Size

School system identifier	Admin. cost ^a	Admin. cost per staff member	Admin. cost per school	Admin. cost per pupil
B11	4,077,610	945	36,735	54
B12	1,707,880	1,031	34,158	59
B13	1,256,160	794	16,975	46
B14	1,309,440	1,073	27,860	55
B15	1,321,210	1,050	29,360	61
B16	822,880	975	19,592	52
B17	507,760	937	23,080	52
B18	614,590	1,157	38,412	75
B19	392,450	1,115	43,606	64
B21	1,416,520	789	24,851	44
B22	283,760	884	14,934	45
B23	280,260	925	15,570	56
M11	3,071,000	974	37,451	64
M12*	955,400*	856*	27,297*	50*
M13	607,220	827	25,300	49
M14	437,190	934	31,228	50
M15	369,530	853	24,635	53
M16	389,080	983	22,887	57
M17	349,020	1,020	31,729	57
M18	174,750	820	19,417	47
M19	213,990	1,150	35,665	71

^a Administrative cost consists of total gross salaries paid by a school system to central office administrative staff (Table 21) and to in-school administrators (Table 22).

* Projected figures

Table 25

Ratios of Central Office Cost to Three
Measures of System Size^a

School system identifier	Cost of C.O. staff	Cost of C.O. staff per staff member	Cost of C.O. staff per school	Cost of C.O. staff per pupil
B11	4,194,630	972	37,790	56
B12	1,240,960	749	24,819	43
B13	980,450	619	13,249	36
B14	733,440	601	15,605	31
B15	975,130	775	21,670	45
B16	742,760	880	17,685	47
B17	467,410	861	21,246	48
B18	484,900	913	30,306	59
B19	300,920	855	33,436	49
B21	1,637,330	912	28,725	50
B22	203,070	633	10,688	32
B23	227,610	751	12,645	46
M11	3,474,510	1,102	42,372	72
M12	600,800	538	17,166	31
M13	470,830	641	19,618	38
M14	249,220	533	17,801	29
M15	154,700	357	10,313	22
M16	273,490	695	16,088	40
M17	206,430	604	18,766	34
M18	128,850	605	14,317	34
M19	154,900	833	25,817	51

^aThe cost of central office staff was defined in Chapter 1 to be the total gross salaries of all central office staff. This cost is obtained from Table 21.

Table 26
Ratios of Support Cost to Three
Measures of System Size

School system identifier	Support cost ^a	Support cost per staff member	Support cost per school	Support cost per pupil
B11	6,249,810	1,448	56,305	83
B12	2,116,996	1,279	42,340	73
B13	2,232,260	1,410	30,166	81
B14	1,418,925	1,163	30,190	59
B15	1,917,950	1,525	42,621	89
B16	1,008,360	1,195	24,009	64
B17	711,720	1,313	32,351	73
B18	758,020	1,428	47,576	93
B19	469,750	1,335	52,194	76
B21	2,285,980	1,274	40,105	70
B22	383,590	1,195	20,189	61
B23	374,754	1,237	20,820	75
M11	5,026,720	1,594	61,302	104
M12*	951,000*	852*	27,171*	50*
M13	676,930	922	28,205	54
M14	500,040	1,068	35,717	58
M15	277,380	641	18,492	40
M16	281,470	711	16,557	42
M17	180,120	527	16,375	29
M18	161,140	757	17,904	43
M19	120,150	646	20,025	40

^aSupport cost consists of total gross salaries paid by a school system to central office support staff (Table 21) and to in-school support staff (Table 23).

* Projected figures.

Table 27
 Ratios of Non-instructional Cost to Three
 Measures of System Size

School system identifier	Non-instructional cost ^a	Non-instructional cost per staff member	Non-instructional cost per school	Non-instructional cost per pupil
B11	11,242,910	2,606	101,287	150
B12	4,318,520	2,608	86,370	148
B13	2,561,280	2,250	48,125	129
B14	2,792,950	2,289	59,424	117
B15	3,610,830	2,870	80,241	167
B16	2,123,990	2,517	50,571	134
B17	1,251,080	2,308	56,867	129
B18	1,532,450	2,886	95,778	188
B19	898,700	2,553	99,856	146
B21	4,064,190	2,264	71,302	125
B22	673,210	2,097	35,432	106
B23	660,390	2,179	36,688	132
M11	8,867,750	2,812	108,143	184
M12*	2,029,200*	1,818*	57,977*	106*
M13	1,349,980	1,839	56,241	108
M14	983,230	2,101	70,231	113
M15	699,410	1,615	46,627	100
M16	722,100	1,823	42,477	107
M17	567,440	1,659	51,586	93
M18	348,790	1,638	38,754	93
M19	360,940	1,941	60,157	119

^aNon-instructional cost consists of total gross salaries paid by a school system to central office staff (Table 21), in-school administrators (Table 22) and in-school support staff (Table 23).

* Projected figures for this system.

Table 28
 Ratios of Instructional Cost to Three
 Measures of System Size

School system identifier	Instructional cost ^a	Instructional cost per staff member	Instructional cost per school	Instructional cost per pupil
B11	26,250,000	6,083	236,486	350
B12	10,516,850	6,351	210,337	362
B13	9,394,990	5,935	126,959	341
B14	7,673,800	6,290	163,272	321
B15	8,416,030	6,690	187,023	390
B16	5,396,360	6,394	128,485	340
B17	3,184,000	5,875	144,727	328
B18	3,176,700	5,982	198,544	389
B19	2,370,500	6,734	263,389	385
B21	11,424,020	6,364	200,421	352
B22	1,908,300	5,945	100,426	302
B23	1,768,670	5,837	98,259	353
M11	20,127,770	6,384	245,461	418
M12*	7,200,000*	6,452*	205,714*	375*
M13	4,180,260	5,695	174,177	335
M14	3,092,590	6,608	220,899	356
M15	2,422,960	5,596	161,531	345
M16	2,226,415	5,622	130,966	329
M17	2,233,960	6,532	203,087	364
M18	1,124,170	5,278	124,908	300
M19	1,009,630	5,428	168,272	333

^a Instructional cost excludes that prorated portion of in-school administrator's gross salaries which was categorized as an administrative cost.

* Projected figures.

Table 24 reveals that the range of administrative costs for the twenty-one school systems was from \$789 to \$1,157 on a per staff member basis, and \$44 to \$75 on a per pupil basis. Table 25 shows that the lowest central office cost per staff member was \$357 whereas the the highest cost was \$1,102. Per pupil costs for central office staff ranged from \$22 to \$72. Support costs varied from a low of \$527 per staff member (Table 26) to a high of \$1,594. Per pupil support costs also ranged widely--from \$29 to \$104. Table 27 indicates that non-instructional costs varied from \$1,615 to \$2,866 on a per staff member basis. Per staff member costs and per pupil costs for the instructional component ranged from \$5,278 to \$6,734 and \$300 to \$418 respectively.

Examination of Subproblems 16, 17, and 18

Subproblem 16: What differences exist among the mean costs per staff member of administrative, central office, support, non-instructional, and instructional personnel in groups of school systems of different sizes?

Subproblem 17: What differences exist among the mean costs per school of administrative, central office, support, non-instructional, and instructional personnel in groups of school systems of different sizes?

Subproblem 18: What differences exist among the mean costs per pupil of administrative, central office, support, non-instructional, and instructional personnel in groups of school systems of different sizes?

Mean cost ratios for the administrative, central office, support, non-instructional, and instructional components were

calculated for four groups of school systems in order to compare the costs of these components among the small, medium, large, and very large systems included in the study. Three sets of cost ratios were determined for each group: mean cost per staff member, mean cost per school, and mean cost per pupil. All cost ratios are expressed in Table 29 and graphed in Figures 4, 5, and 6.

Mean administrative cost ratios. The mean costs per staff member did not indicate a distinct tendency for administrative costs either to increase or decrease for groups composed of large systems. Mean administrative costs per school for the four groups indicated that larger costs were associated with groups composed of successively larger school systems. However, this marked tendency could be more a reflection of a high correlation between the size of a school system and the size of the schools within that system rather than between the size of the school system and the school administrative costs.

Although the mean per pupil administrative costs became successively smaller for Groups 1 through 3, a higher mean cost is revealed for Group 4 (Table 29). This finding is similar to those found earlier concerning the numbers of administrative staff per 100 staff, per school, and per 1000 pupils.

Discussion. The evidence available regarding the mean costs of administrative personnel per staff member is inconclusive. This may be due to the inclusion of support personnel in the calculation of total staff. The mean administrative per pupil costs reported in Table 29 support earlier findings (Table 18) concerning mean ratios of administrative staff. These cost figures indicated that mean

Table 29

Mean Cost of Various Components in Groups of School Systems of Different Sizes

Group	No. of school systems in the group	Size range of group (number of pupils)	Administration	Central office	Support	Non-instructional	Instructional
Mean cost in dollars per staff member							
1	8	3,034-7,016	954	648	883	1,928	5,917
2	5	8,173-15,853	959	774	1,172	2,322	6,101
3	6	19,208-32,470	923	715	1,266	2,362	6,331
4	2	48,106-75,007	957	1,027	1,510	2,693	6,210
Mean cost in dollars per school							
1	8	3,034-7,016	23,361	15,865	21,619	47,187	144,852
2	5	8,173-15,853	25,336	20,467	30,975	61,360	161,270
3	6	19,208-32,470	25,865	20,026	35,465	66,158	177,356
4	2	48,106-75,007	37,039	39,737	58,428	104,200	240,299
Mean cost in dollars per pupil							
1	8	3,034-7,016	55	37	51	111	341
2	5	8,173-15,853	54	44	67	132	347
3	6	19,208-32,470	52	40	71	133	355
4	2	48,106-75,007	58	62	92	163	377

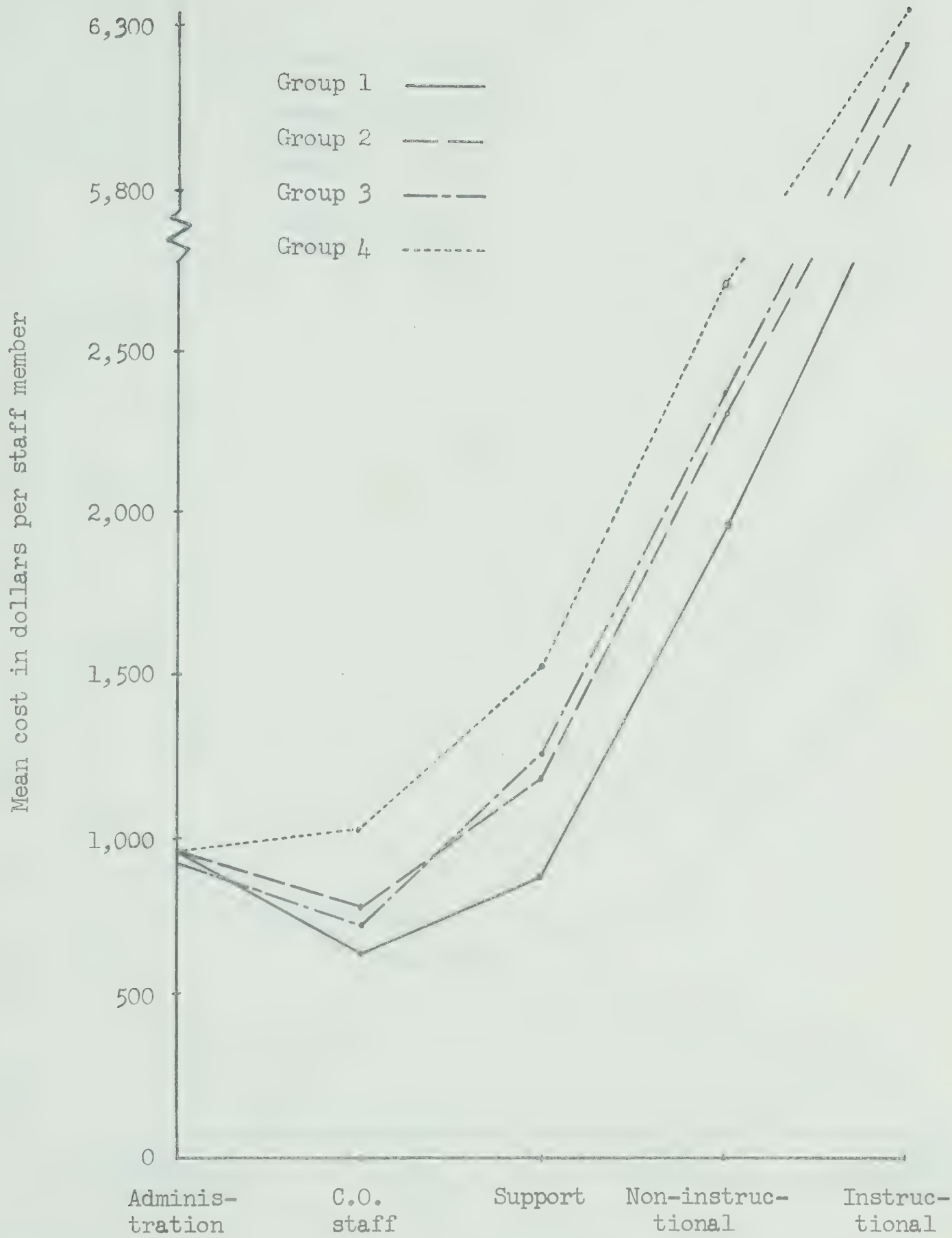


Figure 4

Profiles of the Mean Costs per Staff Member of Various Components in Groups of School Systems of Different Sizes

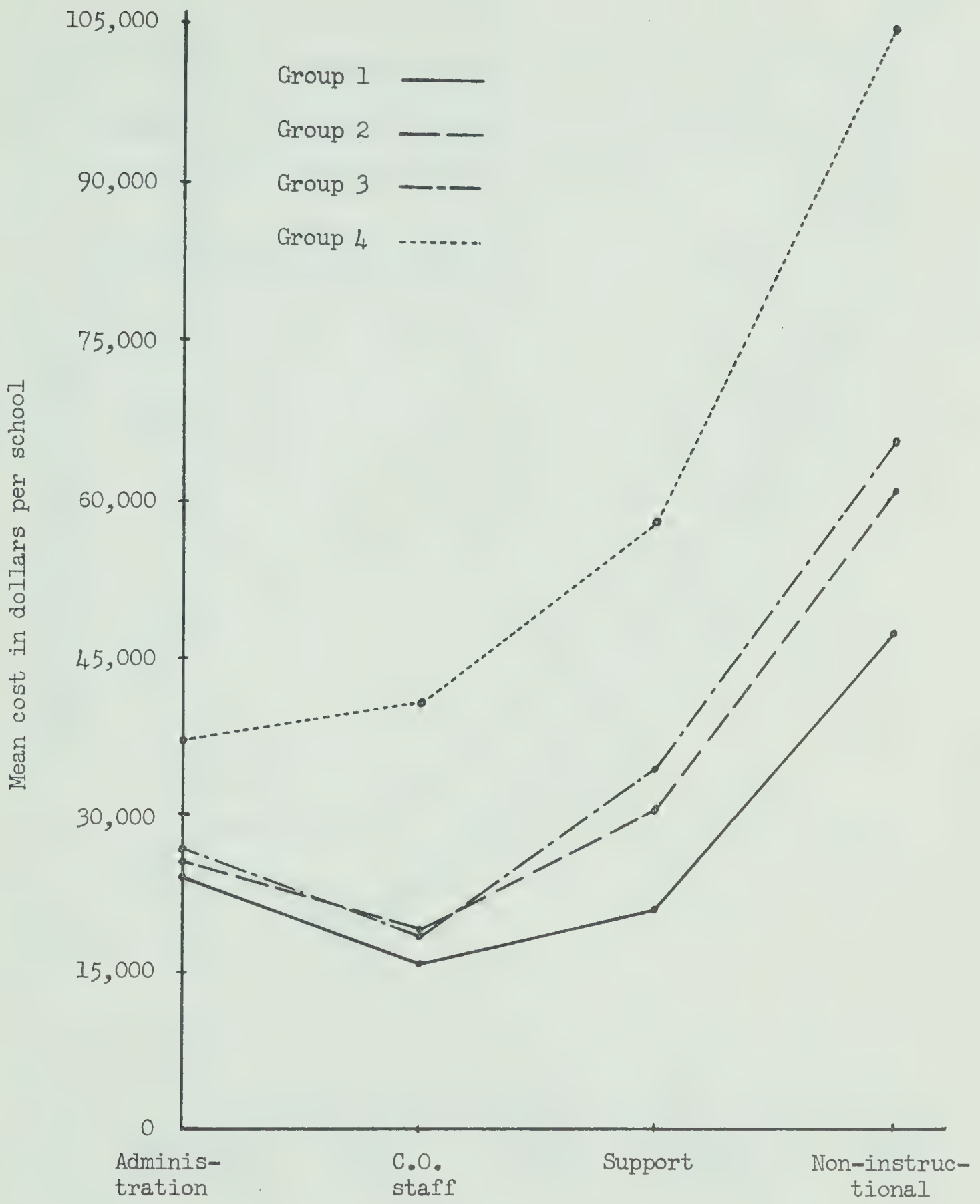


Figure 5

Profiles of the Mean Costs per School of Various Components
in Groups of School Systems of Different Sizes

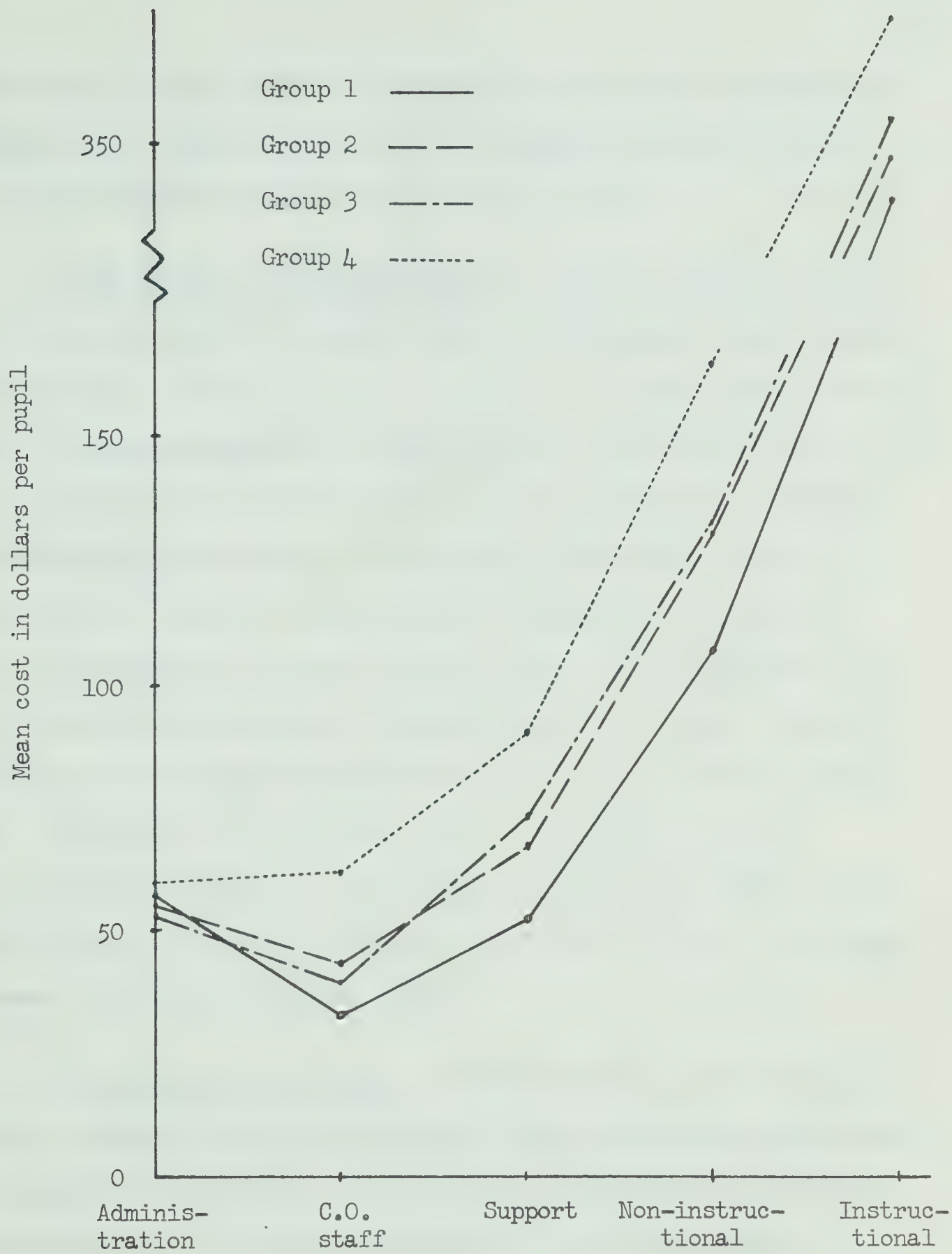


Figure 6

Profiles of the Mean Costs per Pupil of Various Components
in Groups of School Systems of Different Sizes

administrative costs tend to be smaller for the groups consisting of larger school systems but that once the systems exceeded a certain limit, administrative costs once again were larger.

Mean central office cost ratios. A general tendency existed for the mean central office cost ratios to increase as school systems within groups increased in size. In each of the three sets of ratios, Group 1 systems possessed the lowest central office mean cost and Group 4 systems the highest; furthermore, the mean cost for systems in Group 4 was approximately twice the cost for systems in Group 1. These observations are readily apparent in Figures 4, 5, and 6.

Discussion. The mean costs of central office personnel that are reported for each group in Table 29 parallel the mean number of central office personnel tabulated for each group in Table 18 (page 68). Both show a trend for the ratios to increase from Group 1 through Group 4; moreover, this tendency is due to the large differences between the ratios for Groups 1 and 4, and the small differences between the ratios for Groups 2 and 3.

Mean support cost ratios. The mean support cost ratios, as shown in Table 29, were larger for each group successively comprised of larger school systems. This was true irrespective of the measure of system size. The graphical representation of these ratios in Figures 4, 5, and 6 illustrate the wide variations among them.

Discussion. In his investigation, Ward (1964:42-47) found that costs of support personnel increased with increasing size of school systems but that per pupil support costs tended to be lower

for larger systems. The present findings disagreed with the latter ones of Ward. The differences in findings may be attributed to the types of systems investigated by each study. Ward studied ten counties and divisions in Alberta which were primarily small and rural in nature, whereas this study dealt with urban regions in major metropolitan areas.

Mean non-instructional cost ratios. The mean non-instructional cost ratios displayed in Table 29 were always higher for groups containing larger school systems. These results were observed for the mean non-instructional costs per staff member, per school, and per pupil. Large differences in the ratios were evident between all groups with the exception of the mean cost per staff member and the mean cost per pupil for Groups 2 and 3.

Discussion. One point appears evident--the larger metropolitan school systems employed greater proportions of non-instructional personnel than did the smaller systems and paid a corresponding higher proportion for their services. This finding contrasted somewhat with that of Ward who claimed (1964:42-47) that non-instructional costs increased as the number of pupils in the systems increased but decreased in terms of per pupil costs. The per pupil cost ratios for the non-instructional component in Table 29 and the profiles of mean costs in Figures 4, 5, and 6 show definite increases in per pupil costs for the non-instructional component.

Mean instructional cost ratios. The mean instructional costs per staff member and the mean instructional costs per pupil showed that

the group composed of small school systems was characterized by lower ratios than were the other groups. Furthermore, the highest mean instructional per pupil cost was for Group 4 which was comprised of very large systems.

Discussion. The highest costs for each of the four groups as evident by the curves in Figures 4, 5, and 6, and by the numerical size of the cost ratios in Table 29 were the instructional costs. This finding agrees with that of Myroon (1969:132).

Although the mean instructional cost per school appears to increase from Group 1 to Group 4, the increase may be related to the size of the schools within the systems rather than to the size of the system itself.

Examination of Subproblem 19

Subproblem 19: What differences exist among the salary indices of administrative, central office, central office auxiliary, support, non-instructional, and instructional components in groups of school systems of different sizes?

To express total expenditures by school systems for each of the various components as cost indices, operational expenditures were obtained from each system for the 1969 and 1970 calendar years. These figures were then prorated to obtain the operational expenditures for the 1969-70 school year. Finally, the total cost attributed to each component was expressed as a percentage of the operating expenditures to yield the cost index for that component. Specifically, the formula used was $(X \div Y)100 = Z$, where X was the total cost of a particular component, Y represented the operational expenditure of the school

system, and Z referred to the cost index of that component. All operational expenditures and cost indices are recorded in Table 30. The support, administrative, and central office auxiliary cost indices compose the total non-instructional cost indices; these are graphed cumulatively with the instructional cost indices in Figure 7 to illustrate the total percentage of the operational budget spent by each system for salaries of all employees.

Table 30 reveals that administrative cost indices range from 7.3 to 12.3 per cent, central office cost indices vary from 3.6 to 9.7 per cent, central office auxiliary cost indices are as low as 0.2 and as high as 3.2 per cent, the range of support cost indices is from 4.4 to 14.1 per cent, the variation of the non-instructional cost indices is from 13.9 to 28.0 per cent, and the instructional cost indices are in the range 51 to 64.2 per cent. The total percentage of the operational budget spent on salaries varied from 69.0 to 86.9 per cent.

Mean cost indices of various components. Mean cost indices for the central office, administrative, support, central office auxiliary, non-instructional, and instructional components were derived for each of the four groups of school systems and displayed in Table 31. The mean instructional cost indices, and the mean support, mean administrative, and mean central office auxiliary cost indices which comprise the total non-instructional cost indices were graphed cumulatively in Figure 8. The top curve indicates the mean percentage of the operating expenditures which were spent for salaries by school systems in each group during the 1969-70 school year.

Table 30
Instructional and Non-instructional Costs as Percentages of
Operating Expenditures (Cost Indices)

School system identifier	Operational expenditures	Admin. C.O.	C.O. staff auxiliary	Support Non-instruc- tional	Instructional	Instructional & non- instructional		
B11	47,606,000	8.6	8.8	1.9	13.1	23.6	55.1	78.7
B12	16,869,480	10.1	7.4	2.9	12.5	25.6	62.3	87.9
B13	15,885,910	7.9	6.2	0.5	14.1	22.4	59.1	81.5
B14	13,099,550	10.0	5.6	0.5	10.8	21.3	58.6	79.9
B15	13,843,000	9.5	7.0	2.7	13.9	26.1	60.8	86.9
B16	9,037,660	9.1	8.2	3.2	11.2	23.5	59.7	83.2
B17	5,390,320	9.4	8.7	0.6	13.2	23.2	59.1	82.3
B18	5,479,830	11.2	8.8	2.9	13.8	28.0	58.0	86.0
B19	3,822,840	10.3	7.9	1.0	12.3	23.5	62.0	85.5
B21	19,298,600	7.3	8.5	1.9	11.8	21.1	59.2	80.3
B22	3,742,910	7.6	5.4	0.2	10.2	18.0	51.0	69.0
B23	2,946,060	9.5	7.7	0.2	12.7	22.4	60.0	82.4
M11	35,751,500	8.6	9.7	2.2	14.1	24.8	56.3	81.1
M12*	12,015,620	8.0*	5.0*	1.0*	7.9*	16.9*	59.9*	76.8*
M13	6,884,880	8.8	6.8	1.0	9.8	19.6	60.7	80.3
M14	4,813,510	9.1	5.2	1.0	10.4	20.4	64.2	84.6
M15	4,261,160	8.7	3.6	1.2	6.5	16.4	56.9	73.3
M16	4,401,640	8.8	6.2	1.2	6.4	16.4	50.6	71.0
M17	4,077,590	8.6	5.1	0.9	4.4	13.9	54.8	68.7
M18	2,049,570	8.5	6.3	0.6	7.9	17.0	54.8	71.8
M19	1,742,300	12.3	8.9	1.5	6.9	20.7	57.9	78.6

* Cost indices were calculated on the projected costs of each component.

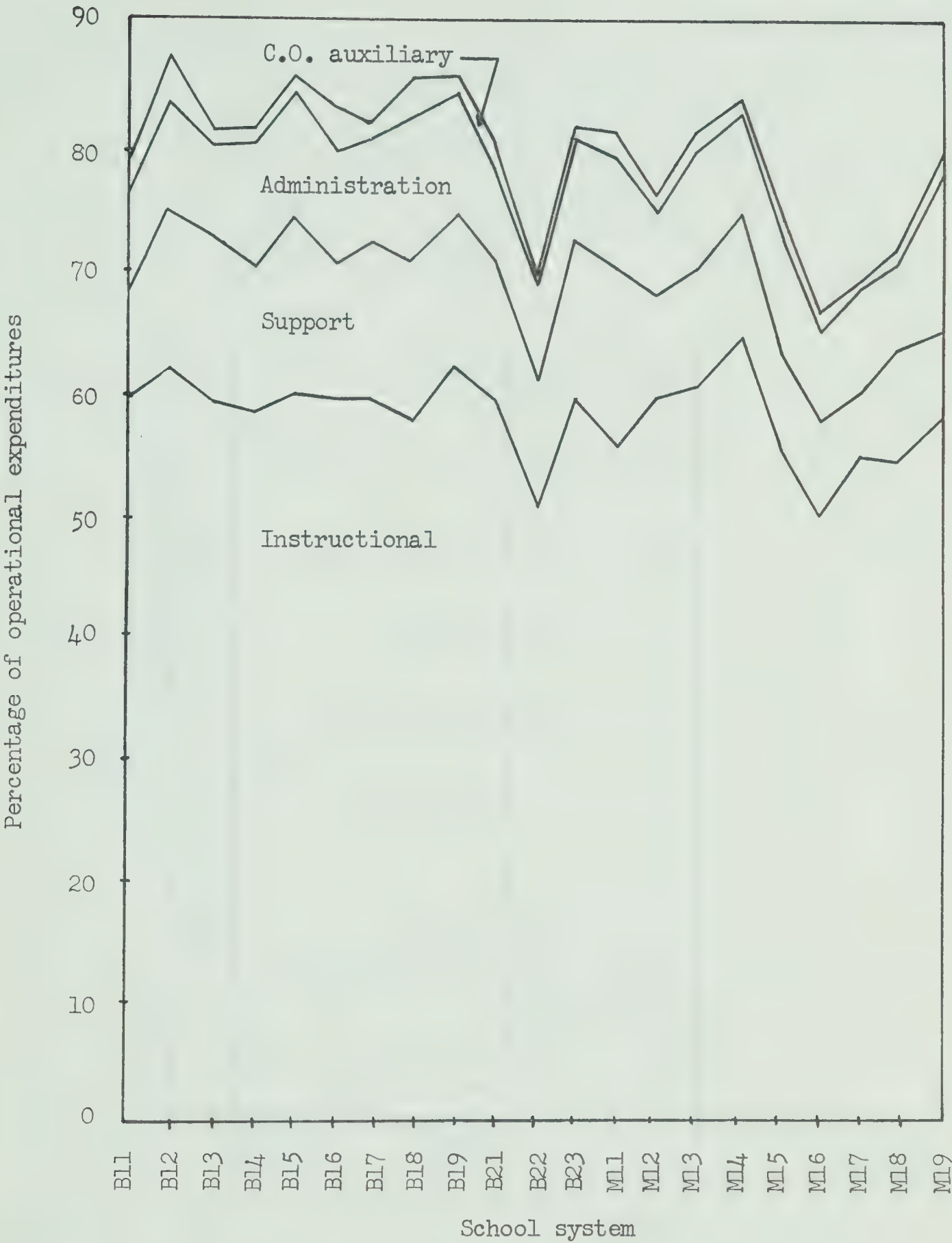


Figure 7
Cumulative Instructional and Non-instructional
Cost Indices

Table 31
Mean Cost Indices of Various Components in Groups of
School Systems of Different Sizes

Group	No. in group	Size range of group (number of pupils)	C.O. staff	Administration	Support	C.O. auxiliary	Non-instructional	Instructional
1	8	3,034-7,016	6.1	9.0	8.3	0.8	18.1	55.7
2	5	8,173-15,853	7.6	9.5	11.6	1.9	22.9	60.2
3	6	19,208-32,470	6.8	8.8	12.0	1.6	22.4	60.0
4	2	48,106-75,007	9.2	8.6	13.5	2.0	24.1	55.6

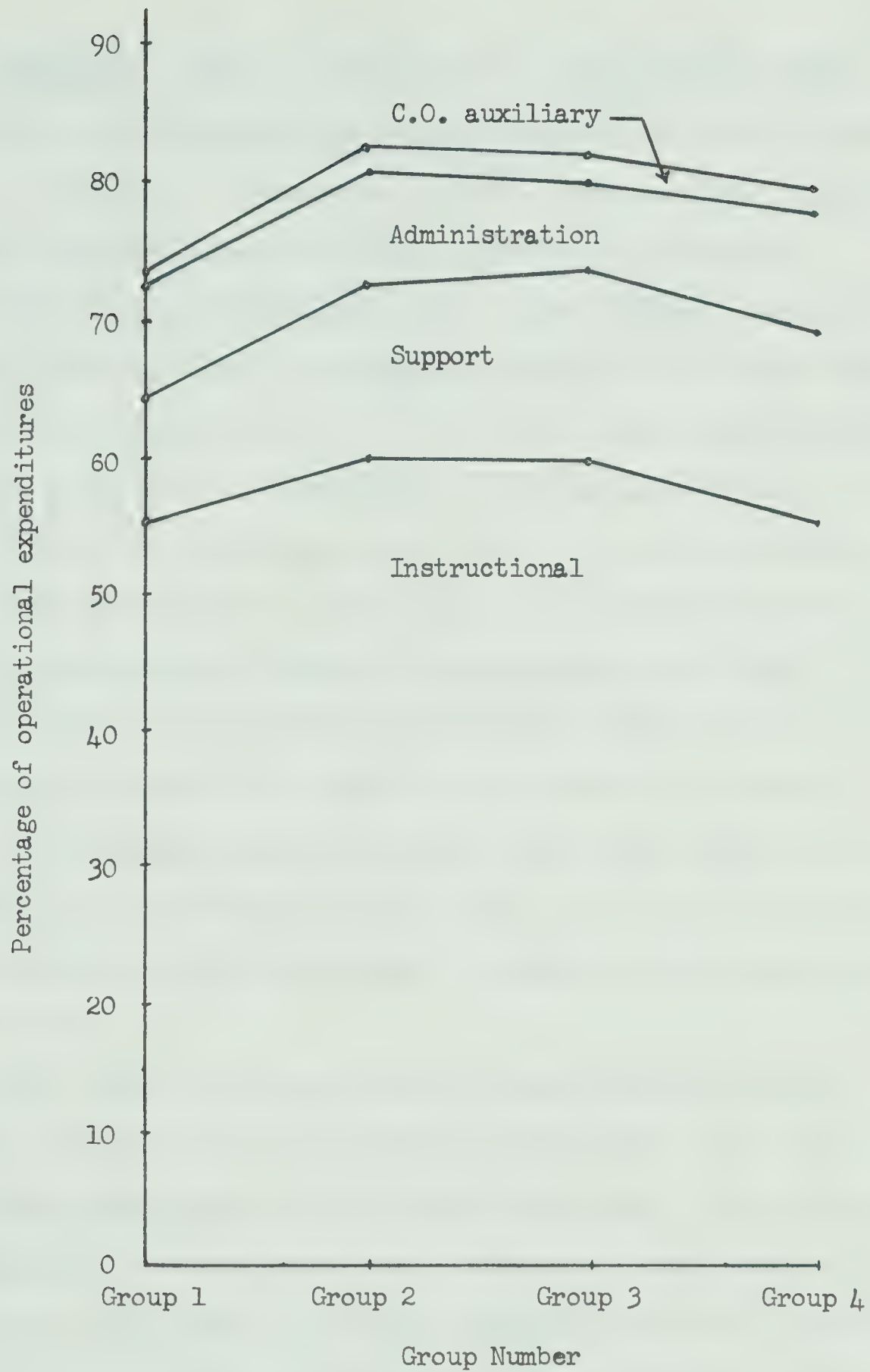


Figure 8
Cumulative Mean Cost Indices of Instructional and
Non-instructional Components for Groups of
School Systems of Different Sizes

Discussion. Table 31 and Figure 8 indicate that both the small and very large systems spent approximately 56 per cent of their operational budgets on instructional salaries, whereas other systems spent approximately 60 per cent of their operational budgets on instructional salaries. Ostensibly, this figure differs considerably from the figure of 70 per cent suggested by the C. T. F. (1967:44-46). However, in the current study, the instructional cost index does not include any costs attributed to administrative personnel located in schools or in central offices who, by virtue of their teacher certification, may be eligible for government grants under a foundation program and therefore be classed by the system as instructional personnel. Since a large majority of the administrative costs were earlier found to be due to in-school administrators, a substantial portion of the roughly 9 per cent figure reported here would have been added onto the instructional figure by the C. T. F. If this is done, the new figures obtained do not appear incompatible with those reported by the C. T. F.

Small (1967:56,59) found that the "administrative service index" for the Edmonton Public School District was 23.1 per cent of their current expenditures for the 1966-67 school year. This figure is in agreement with the present results (Edmonton would have been in Group 4) even though Small used "current expenditures" as the denominator rather than "operating expenditures." The non-instructional indices also approximate the findings by Myroon (1969:132-133), who reported that salaries for in-school administrators, central office administrators, and plant operation and maintenance personnel accounted

for approximately 20 per cent of the costs experienced by the Thorhild County school system in the 1968-69 school year.

Summary of Chapter 5

Costs of in-school administrators were determined by summing that percentage of their basic salaries which was equivalent to the percentage of time spent in non-teaching duties with their total gross allowances. These costs and the total gross salaries of central office administrative staff formed the total administrative costs.

Mean cost ratios were obtained for various components in four groups of school systems. Some of the results were: (1) there was a general tendency for lower mean per pupil administrative costs to be associated with larger school systems, but once a certain level was reached the costs were again higher; (2) a tendency existed for higher mean central office costs to be associated with larger systems; however, this trend may have been due to the large differences between the ratios for the small and very large groups in this study; (3) mean support cost ratios and mean non-instructional cost ratios were larger for each group comprised of successively larger systems; and (4) small systems had the lowest mean instructional costs per pupil, while the very large systems had the highest mean instructional costs per pupil.

Total costs of each component were also expressed as a percentage of the operational expenditures. Examination of these cost indices revealed that (1) instructional costs accounted for approximately 56 per cent of the operational expenditures of small and very large systems, and 60 per cent of the operational expenditures of medium and large systems; (2) mean administrative indices were

approximately 9 per cent; (3) mean support indices were higher for groups of larger systems; (4) mean non-instructional indices showed a tendency to be larger for groups consisting of larger systems; and (5) small school systems in the study spent 73.8 per cent of their operational expenditures on salaries while larger systems spent approximately 80 per cent of their operational expenditures on salaries.

Chapter 6

MEAN RATIOS OF VARIOUS COMPONENTS IN GROUPS OF SCHOOL SYSTEMS COMPOSED OF DIFFERENT NUMBERS OF SCHOOL JURISDICTIONS

This chapter examines the relationship between the mean ratios of the numbers of staff in, and the mean costs of, various components in groups of school systems whose total numbers of pupils were similar but whose compositions included different numbers of school jurisdictions. These relationships were determined for three groups of systems within metro Vancouver, three groups of systems within metro Winnipeg, and for the three groups comprised of the Vancouver school district, the two school systems in metro Edmonton, and the nine school systems in metro Winnipeg. Two measures were used to express system size: total number of staff and total number of pupils. The total number of schools was not used as an indicator of system size since earlier results suggested that a high correlation probably existed between the size of schools and the size of the school system.

MEAN RATIOS OF VARIOUS COMPONENTS IN GROUPS OF SCHOOL SYSTEMS WITHIN METRO VANCOUVER AND METRO WINNIPEG

Examination of Subproblems 20 and 21

Subproblem 20: What differences exist between the mean percentages of staff in the administrative, central office, central office auxiliary, support, non-instructional, and instructional components in

groups of school systems similar in total size but composed of different numbers of school jurisdictions?

Subproblem 21: What differences exist between the mean number of personnel per 1000 students in the administrative, central office, central office auxiliary, support, non-instructional, and instructional components in groups of school systems similar in total size but composed of different numbers of school jurisdictions?

Mean number of staff for various components in groups of school systems within metro Vancouver. Mean percentages of total staff and mean numbers of staff per 1000 pupils were computed for ten components in three groups of school systems within metro Vancouver and displayed in Table 32. The first group was composed of a very large system, the second group contained three medium-sized districts, and the third group was comprised of five small systems. All groups were similar in total pupil size.

The group consisting of five small school systems had the highest central office administrative and total administrative ratios, and the lowest in-school administrative ratios. Little difference appeared evident between the very large school system and the group comprised of three medium-sized school systems.

The total central office ratios indicated that the very large school system in metro Vancouver contained the highest proportion of total staff employed in the central office and that the smallest ratios were associated with the group of medium-sized districts.

In-school support, total support ratios, and non-instructional ratios were highest for the very large system and lowest in all but

Mean Numbers of Staff per 100 Total Staff and Mean Number of Staff per 1000 Pupils
for Various Components in Groups of School Systems Composed of
Differing Numbers of School Jurisdictions
within Metro Vancouver

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one case for the group of small systems. The ratios of support staff in the central office were also consistently higher for the very large system but appear lowest for the group consisting of medium-sized school systems.

The group of small systems in metro Vancouver contained the highest ratios for the instructional component; the lowest ratios were experienced by the one very large system.

Mean number of staff for various components in groups of school systems within metro Winnipeg. Table 33 contains mean percentages of total staff and mean numbers of staff per 1000 pupils for ten components in three groups of school systems within metro Winnipeg. Group 1 was composed of one very large system, Group 2 was comprised of two medium-sized systems, and Group 3 contained six small districts.

All administrative ratios--central office, in-school, and total administrative--were highest for the group comprised of six small systems and lowest for the group containing two medium-sized districts. This observation was true for both the mean percentages of total staff and mean number of staff per 1000 pupils. Ratios for the one very large school system were consistently highest for the central office auxiliary, central office support, total central office staff, in-school support, support, and non-instructional components. The lowest ratios for all support categories were associated with the group composed of the six smallest systems in metro Winnipeg. The only recurring observation pertaining to the instructional ratios was that the very large school system possessed the lowest, or nearly lowest, proportion of their staff in the instructional component.

Table 33
Mean Numbers of Staff per 100 Total Staff and Mean Number of Staff per 1000 Pupils
for Various Components in Groups of School Systems Composed of
Differing Numbers of School Jurisdictions
within Metro Winnipeg

No. of school jurisdictions in each group	Component									
	C.O. admin.	C.O. auxiliary	C.O. support	Total C.O. staff	In-school admin.	In-school support	Administration	Support	Non-instructional	Instructional
	Mean number of staff per 100 staff (percentage of total staff)									
1	2.22	2.06	7.61	11.89	4.06	19.25	6.28	26.86	35.20	64.80
2	1.84	1.08	4.92	8.27	4.02	13.84	5.85	18.76	26.12	74.31
6	2.89	1.42	3.68	8.00	4.84	14.23	7.73	17.91	27.07	72.93
	Mean number of staff per 1000 pupils									
1	1.46	1.35	4.99	7.80	2.66	12.62	4.12	17.61	23.07	42.47
2	1.07	0.63	2.87	4.83	2.34	8.08	3.42	10.95	15.25	43.38
6	1.67	0.82	2.12	4.61	2.79	8.19	4.45	10.31	15.59	42.00

Discussion. The mean ratios for the numbers of personnel in each of the various components of the groups of school systems in the metro areas of Vancouver and Winnipeg parallel those obtained earlier for the four groups of school systems in Western Canada. In each case the administrative ratios were highest for the groups comprised of small systems and generally lowest for the groups comprised of medium-sized districts. The total administrative ratios were not lowest for the very large systems because of evident increases in both their central office and in-school administrative proportions. Other similarities were that (1) the highest proportion of non-instructional and support personnel were always associated with groups containing large school systems and that the lowest proportion of these personnel were usually found in groups comprised of small school systems; (2) there was a tendency for larger proportions of total staff to be centrally located in groups containing large systems; however, this tendency was not too pronounced, and (3) lower instructional ratios were a characteristic of the groups composed of very large systems.

Examination of Subproblems 22 and 23

Subproblem 22: What differences exist between the mean cost per staff member for the administrative, central office, central office auxiliary, support, non-instructional, and instructional components in groups of school systems similar in total size but composed of different numbers of school jurisdictions?

Subproblem 23: What differences exist between the mean cost per pupil for the administrative, central office, central office auxiliary, support, non-instructional, and instructional components in

groups of school systems similar in total size but composed of different numbers of school jurisdictions?

Mean cost ratios of various components in groups of school systems in metro Vancouver. Mean costs per staff member and mean costs per pupil for various components in the three groups of school systems in metro Vancouver are shown in Table 34. This table indicates that the one large school system had the highest costs for the central office support, the total central office, and the support components. On the other hand, the same system enjoyed the lowest per staff member and per pupil costs for the in-school administrative, in-school support, and total administrative components. The group consisting of five small systems had the highest cost ratios for all the administrative components, and the central office auxiliary, in-school support, non-instructional, and instructional components.

Mean cost indices for various components were calculated and tabulated in Table 35. These indices revealed that the group of small systems spent a larger proportion of their operational expenditures on administrative, central office auxiliary, and non-instructional staff than did the other groups. The group containing one very large system had the highest cost indices for the central office and support components.

Mean cost ratios of various components in groups of school systems in metro Winnipeg. Mean costs per staff member and mean costs per pupil for the various components in the three groups of school systems in metro area Winnipeg are presented in Table 36. In this

Table 34

Mean Costs per Staff Member and Mean Costs per Pupil for Various Components
in Groups of School Systems Composed of Different Numbers of
School Jurisdictions within Metro Vancouver

No. of school jurisdictions in each group	Total number of pupils in the group	Mean cost in dollars per staff member								Instructional
		C.O. admin.	C.O. auxiliary	C.O. support	Total C.O. staff	In-school admin.	In-school support	Administration	Support	Non-instructional
1	75,007	237	212	522	972	708	925	945	1448	2606
3	80,581	186	142	335	663	772	958	958	1294	2394
5	61,473	250	253	339	842	787	1040	1037	1380	2670
		Mean cost in dollars per pupil								
1	75,007	14	12	30	56	41	53	53	83	150
3	80,581	10	8	19	37	43	53	54	72	132
5	61,473	14	15	19	48	45	59	60	79	153
										350
										342
										366

Table 35

Mean Cost Indices of Various Components in Groups of School Systems
in Metro Vancouver and Metro Winnipeg

No. of school jurisdictions in each group	Total No. of pupils	Total central office	Admin. Support	C.O. auxiliary	Non-instructional	Instructional	Non-instructional and instructional
Mean cost indices in groups of school systems in metro Vancouver							
1	75,007	8.8	8.6	13.1	1.9	23.6	55.1
3	80,581	6.4	9.3	12.6	1.4	23.3	60.2
5	61,473	7.9	9.7	13.0	2.4	25.1	60.0
Mean cost indices in groups of school systems in metro Winnipeg							
1	48,106	9.7	8.6	14.1	2.2	24.8	56.3
2	31,691	5.7	8.3	8.6	1.0	17.9	60.2
6	35,392	5.5	9.1	7.1	1.1	17.2	56.7

Table 36

Mean Costs per Staff Member and Mean Costs per Pupil for Various Components
in Groups of School Systems Composed of Different Numbers of
School Jurisdictions within Metro Winnipeg

No. of school jurisdictions in each group	Total number of pupils in the group	Mean cost in dollars per staff member							Mean cost in dollars per pupil			
		C.O. admin.	C.O. auxiliary	C.O. support	Total C.O. staff	In-school admin.	In-school support	Administration	Support	Non-instructional	Instructional	
1	48,106	306	244	552	1102	688	1042	974	1594	2812	6384	
2	31,691	234	102	244	579	611	636	845	880	1826	6151	
6	35,382	309	112	152	573	640	593	949	746	1807	5942	
Mean cost in dollars per pupil												
1	48,106	20	16	36	72	44	68	64	104	184	418	
2	31,691	14	6	14	34	36	37	49	51	107	359	
6	35,382	18	6	9	33	37	34	55	43	104	342	

metro region the highest cost ratios for all components, with the exception of the central office administrative component, were associated with the one large school system. The group composed of six small systems possessed the highest central office administrative costs and the second highest costs for the in-school and total administrative components. Cost ratios determined for the support, non-instructional, and instructional components appeared to be related to the size of school systems within the groups.

Similar findings were made with respect to the cost indices (Table 35) for the various components. The highest cost indices for the support, non-instructional, and total central office components were associated with the large system and the highest cost index for the administrative components was associated with the group consisting of small systems.

Discussion. The mean costs for the various components in the groups of school systems in metro Vancouver did not follow the general trend set by the earlier findings regarding costs. Deviations occurred with respect to the non-instructional, in-school support, and administrative components. In each case the reported ratios were less than expected as judged on the basis of the proportions of personnel found in each component and the results concerning costs that were discussed in Chapter 5. Similarly, the non-instructional and cost indices were somewhat less than expected.

The mean costs determined for various components in groups of school systems in metro Winnipeg were similar to those observed earlier for the four groups of school systems formed from the twenty-

one systems in this study. Further, the cost ratios followed the patterns or trends established by the ratios concerning the number of staff in each component. As a result, the costs per staff member and per pupil, and the salary indices, for the non-instructional and support components were highest for the large system.

The differences in trend for the costs of the various components in the two metro areas suggested that variations in mean costs may be attributed to differences in the financial resources among the school systems within a metro region. Should little variation exist in their economic basis, then no clearly distinguishable trend is visible for the mean costs of each component. However, where resource differences do exist, the larger systems appear to have higher mean costs.

MEAN RATIOS OF VARIOUS COMPONENTS IN GROUPS OF SCHOOL SYSTEMS IN THREE METRO AREAS

An attempt was made to compare the mean number of staff in, and the mean cost of, various components in three groups of school systems in three separate metro areas in Western Canada. These groups were composed of (1) the Vancouver school system, (2) the two school systems in metro Edmonton, and (3) all nine school systems in metro Winnipeg. These three groups were chosen because they contained approximately equal numbers of pupils but they varied extensively in the number of school jurisdictions. Data for the two systems in metro Edmonton were obtained from a companion study by Olynyk (1970).

Mean Number of Staff in Various Components

The results of the analysis concerning the mean percentage of staff and the mean number of staff per 1000 pupils for the three groups are expressed in Table 37. The findings show that Vancouver had the highest mean percentage of staff in the central office auxiliary, central office support, total central office, support, and non-instructional components. The group comprised of systems in metro Edmonton had a substantially higher percentage of total staff in the administrative component than did the other two groups. This was due to a slightly higher percentage of administrative staff located in schools and a significantly higher percentage of total staff in central office administrative positions. On a per 1000 pupils basis the differences were even more evident. The two school systems in Edmonton collectively employed a considerably higher proportion of their employees in administrative positions. Moreover, on a per 1000 pupils basis, these same two systems also maintained higher numbers of employees for all components but the central office auxiliary component. The nine school systems in metro Winnipeg had higher proportions of personnel than did Vancouver for the instructional and administrative components, and had consistently higher ratios than the two systems in Edmonton for only the central office auxiliary component. Hence, Edmonton appeared to employ considerably higher proportions of administrative personnel and higher mean numbers of personnel per 1000 pupils for most components than did Vancouver or the combined group of smaller systems in metro Winnipeg.

Table 37

Mean Numbers of Staff per 100 Total Staff and Mean Numbers of Staff per 1000 Pupils for Various Components in Groups of School Systems Composed of Differing Numbers of School Jurisdictions in Three Major Metro Areas in Western Canada

School jurisdictions included in each group	Total number of pupils in the group	Mean number of staff per 100 staff (percentage of total staff)									
		C.O. admin.	C.O. auxiliary	C.O. support	Central office	In-school admin.	In-school support	Administration	Support	Non-instructional	Instructional
Vancouver school district Metro Edmonton ^a Metro Winnipeg	75,007	1.46	1.71	9.62	12.79	4.25	18.42	5.71	28.04	35.46	64.54
	103,167	2.67	0.98	8.24	11.89	4.32	18.74	6.99	26.98	34.95	65.05
	115,189	2.32	1.62	5.77	9.81	4.27	16.38	6.59	22.14	30.46	69.65
		Mean number of staff per 1000 pupils									
Vancouver school district Metro Edmonton ^a Metro Winnipeg	75,007	0.84	0.99	5.53	7.36	2.44	10.60	3.28	16.13	20.40	37.13
	103,167	1.88	0.69	5.80	8.37	3.04	13.18	4.92	18.98	24.59	45.77
	115,189	1.42	0.99	3.52	6.00	2.61	10.01	4.09	13.53	18.62	42.57

^aData for school systems in metro Edmonton were obtained from a companion study by Olynyk (1970).

Mean Cost Ratios of Various Components in the Three Groups

Since each of these groups was located in different geographical regions, which in turn were characterized by substantially different economic bases, costs per staff member and per pupil were not calculated for each component. Instead, mean cost indices were determined for each component and displayed in Table 38. The cost indices revealed that the school systems in Edmonton spent a higher percentage of their operating budget on the salaries of personnel for each non-instructional component (except central office auxiliary and support) and for the instructional component than did the other two groups. Thus, Edmonton school systems spent 10.7 per cent of their operational expenditures for administration, 12.4 per cent for support, and 1.2 per cent for central office auxiliary staff. These combined expenditures formed the non-instructional salary index of 24.3 per cent.

Summary of Chapter 6

This chapter examined the relationship between the mean ratios of the number of staff in, and cost of, various components in groups of school systems whose total numbers of pupils were similar but whose composition included different numbers of school jurisdictions.

The mean ratios for the numbers of personnel in each of the various components of the groups of school systems within the metro areas of Vancouver and Winnipeg were similar to those obtained for the four groups of school systems in Western Canada. The groups composed of small systems had the highest administrative ratios whereas the very large systems had the highest support and non-

Table 38

Mean Cost Indices of Various Components in Groups of School Systems
in Three Major Metropolitan Areas in Western Canada

Group	School jurisdictions included in each group	Total number of pupils	Central office	Administration	Support	C.O. auxiliary	Non-instructional	Instructional	Non-instructional and instructional
1	Vancouver school district	75,007	8.8	8.6	13.1	1.9	23.6	55.1	78.7
2	Metro Edmonton	103,167	9.8	10.7	12.4	1.2	24.3	58.3	82.6
3	Metro Winnipeg	115,189	7.5	8.6	10.8	1.6	21.0	57.4	78.4

^aData for metropolitan area A1 were obtained from a companion study by Olynyk (1970).

instructional ratios. Although the very large systems tended to employ smaller mean percentages of their total staff in the instructional component, the mean number of instructional staff per 1000 pupils was relatively the same for all groups. This indicated that the very large systems tended to employ more staff per 1000 pupils than did the other systems.

Mean costs of the various components in the groups of school systems in metro Vancouver and metro Winnipeg indicated that variations in costs among groups were perhaps considerably influenced by large variations in the economic bases of the school systems in each metro area. Hence, differences in mean expenditures per staff member and per pupil were not as evident among the groups of systems in metro Vancouver as in metro Winnipeg.

Further results showed that the Edmonton systems had higher proportions of their total staff in administrative positions and higher numbers of staff on a per 1000 pupils basis for all but the central office auxiliary components than did either Vancouver or the nine jurisdictions taken collectively in metro Winnipeg. Furthermore, the two systems in metro Edmonton also had higher cost indices for the central office, administrative, non-instructional, and instructional components. Thus, these systems spent a higher percentage of their operational expenditures for salaries of their total staff than did the other two groups.

Chapter 7

SUMMARY AND CONCLUSIONS

This study described the relationships between the size of twenty-one school systems and (1) the size, and (2) the cost of their administrative, central office, support, non-instructional, and instructional components during the 1969-70 school year. This investigation also attempted to compare staffing ratios and costs of groups of school systems within the metro areas of Vancouver and Winnipeg. These main problems were divided into twenty-three subproblems.

The purposes of this study restricted the choice of the sample to school systems in the major metropolitan regions in Western Canada. Included were nine school systems in metropolitan Vancouver, three in metropolitan Victoria, and nine in metropolitan Winnipeg. Since the sample was deliberately chosen, descriptive rather than inferential statistics were appropriate.

Three general methods were employed in data collection. First, the superintendent of each participating school system was asked to provide relevant data. Second, follow-up letters were sent to some systems, and third, personal interviews were conducted with superintendents to ensure proper interpretation and completion of the questionnaire.

Examination of Subproblems 1 - 12

Subproblems 1, 2, and 3. For the twenty-one school systems in this study, the percentage of staff in administrative positions was significantly negatively correlated with the total staff, the total number of schools, and the total number of pupils in a school system.

The conclusion that the administrative ratio tended to be smaller in larger systems provides supportive evidence for similar findings in studies by Anderson and Warkov (1961:26-27), Gill (1967:103), Tosi and Patt (1967:164-168), Indik (1964:301-309), Blowers (1969:67), and Vithayathil (1969:74), even though a different procedure for determining the number of in-school administrative personnel was utilized. The same conclusion offered non-supportive evidence for the findings of Terrien and Mills (1955:13).

The high negative correlation obtained between the percentage of staff in administrative positions and the total number of schools contradicts the suggestion by Anderson and Warkov (1961:27) that the relative size of the administrative component increases as the number of places at which work is performed increases.

Subproblems 4, 5, and 6. A positive, but insignificant correlation was obtained between the size of the central office component and each measure of system size.

These findings could be compared with those of Carter (1968:53) who showed that larger ratios of total central office staff per 1000 pupils were associated with smaller systems and that correspondingly smaller ratios were associated with school systems that

increased in size to approximately 12,000 students. Beyond this point the ratios began to increase. The systems investigated in this research tended to be slightly larger than 12,000; hence, the small, but positive correlation supported Carter's findings.

Subproblems 7, 8, and 9. Significant, positive correlations were obtained between the percentage of total staff in support positions in the twenty-one systems and each measure of their system size. These results further reinforce Carter's statements and those of Haire (1959:297).

Subproblems 10, 11, and 12. The Pearson correlation coefficient which related the percentage of total staff in the non-instructional component to the three measures of system size was significantly positive in each case. Hence, larger proportions of non-instructional personnel existed in the large systems rather than in the small systems in the sample.

These results did not support the findings by Haas, Hall, and Johnson (1963:13) who wrote that the supportive component decreased as organizations increased in size. However, of the thirty organizations studied, only one was educational.

Examination of Subproblems 13, 14, and 15

In order to compare various ratios pertaining to smaller systems in the metro areas with those of the larger systems, the twenty-one school systems were categorized on the basis of number of pupils into four groups.

Mean administrative ratios. Inspection of the ratios for each group showed that the mean administrative ratios were smaller for each group containing successively larger school systems; however, the ratios were again larger for groups of very large systems. This latter finding differed from those of Blowers (1969:72) and Gill (1967:46), but supported those of Vithayathil (1969:53-55). A further finding was that the very large systems contained larger proportions of administrative staff in both the central office and in schools. The results of this finding and those of Carter and Vithayathil seem to suggest that minimal administrative ratios may be associated with school systems of a certain size.

Mean central office ratios. A much larger mean central office ratio for systems in Group 4 appeared responsible for establishing a tendency for larger central office components to be associated with larger school systems. This finding supports Carter's results--that central office ratios tend to be larger in larger systems.

Mean support ratios. Inspection of the ratios showed marked tendencies for the mean ratios of in-school support, in-school clerical, in-school aides, central office clerical, and central office support components to be larger for groups consisting of larger school systems. Haire (1959:297) reported similar results concerning the number of clerical workers in organizations.

Mean non-instructional ratios. Irrespective of the measure used to describe system size, the ratios calculated for the non-instructional component were substantially higher for groups composed

of larger systems than for groups composed of smaller systems. This result offered supportive evidence for Indik's observation that his results differed from those of Terrien and Mills because the latter included support personnel in their administrative component, and further non-supportive evidence for the findings of Haas, Hall, and Johnson.

Mean instructional ratios. Groups of larger systems employed a lower mean proportion of total staff, and a lower number of staff per 1000 pupils, in the instructional component than did groups of smaller systems.

Examination of Subproblems 16, 17, 18, and 19

Total gross salaries of personnel in each component were reported in prorated form for the 1969-70 school year and taken to represent the cost of that component. Costs of in-school administrators were further prorated according to the Percevault formula (1964:17-18).

Mean administrative cost ratios. Mean administrative costs per staff member for each group produced inconclusive results; however, the mean administrative costs per pupil clearly indicated a tendency for lower costs to be associated with groups containing large systems than for groups containing small systems. Furthermore, the mean costs were again larger once an optimal size was passed.

Mean central office cost ratios. A tendency was evident for lower mean central office cost ratios to exist for groups of larger systems, but definite results were not established.

Mean support cost ratios. Results of the mean support cost ratios paralleled the results pertaining to mean numbers of staff in the support component--both were larger as systems within groups increased in size. Ward reported (1964:42-47) that support costs decreased on a per pupil basis as the number of pupils increased; however, this finding was disputed by the results of this study.

Mean non-instructional cost ratios. Mean non-instructional costs were higher for groups of larger school systems than for groups of smaller systems regardless of which measure was used as an indicator of the size of the system. This finding further disagrees with Ward's results concerning non-instructional costs.

Mean instructional cost ratios. Mean instructional costs per staff member and per pupil showed that groups composed of smaller school systems tended to have lower ratios than did the other groups while the group composed of very large systems had the highest mean instructional costs.

Mean cost indices. Mean cost indices were determined for each component in a group by expressing the total gross salaries of all employees in a component as a percentage of the group's operational expenditures.

The results showed that small and very large systems spent approximately 56 per cent of their operational budgets on instructional salaries, whereas other systems spent about 60 per cent of their operational expenditures on instructional salaries. A tendency existed for groups of large systems to have higher non-instructional, central

office auxiliary, support, and central office indices, and lower administrative indices than did groups of smaller systems. These findings supported those of Small (1967:56, 59), the C. T. F. (1967:44-46), and Myroon (1969:132-133).

Examination of Subproblems 20 and 21

The mean ratios obtained for the numbers of personnel in each of the various components for groups of school systems in metro Vancouver and metro Winnipeg were similar to those obtained for the four groups of school systems in Western Canada. Highest mean administrative ratios were once again associated with the smallest systems and highest mean support and instructional ratios were associated with the largest systems. A tendency also existed for the larger systems to employ more personnel per 1000 pupils than did the smaller systems in each metro area.

Whereas the mean cost ratios for each component in the groups of school systems in metro Vancouver deviated somewhat from the patterns established by the four groups of school systems in Western Canada, the mean cost ratios calculated for the components in the groups of school systems in metro Winnipeg closely resembled the earlier patterns. These differences suggested that variations in costs may be due to variations in the economic base among metro areas.

Examination of Subproblems 22 and 23

Comparison of ratios for three groups of systems in the metro areas of Vancouver and Winnipeg revealed that two systems in metro Edmonton had higher proportions of their total staff in administrative positions and higher numbers of staff on a per 1000 pupils basis for

all components (except the central office auxiliary component) than did the Vancouver school district or the nine jurisdictions taken collectively in metro Winnipeg. These same two systems also had the highest mean cost indices for all but the central office auxiliary component.

IMPLICATIONS OF THE FINDINGS

One of the findings of this study that has implications for the organization of schools was that larger systems usually had lower administrative ratios. However, the ratios for the very large systems included in this study had slightly higher administrative ratios. This implies, as Litterer suggested, that there are advantages of scale in the managerial area as there are in areas of production and finance. However, this advantage appears to be lost once a certain point in the organization's size is exceeded. Larger size may make efficient specialization possible and avoid duplication of efforts, but excessive size in terms of the number of employees may cause unprecedented increases in bureaucratization.

Another finding of considerable importance was that the larger systems in this study employed higher proportions of their total staff in support and in non-instructional capacities than did the smaller systems. Furthermore, the cost of each component varied directly with its size. Thus, the larger systems employed and paid proportionately more for support and non-instructional personnel than did smaller systems. A crucial question arises: Are the proportionate increases in support and non-instructional staff and their concomitant costs

going to be made at the expense of instructional staff? If not, can systems afford both?

RECOMMENDATIONS FOR FURTHER STUDY

The present study endeavored to prorate the time of all in-school administrative personnel based on an estimated average percentage of time spent in non-teaching functions. This estimate may be in considerable error. Similar studies such as this one but for single systems may prove exceedingly valuable both for the school system and for administrative theory since prorations could be done with much more accuracy.

A similar study concerning the number of staff employed in each component could be carried out for systems randomly chosen across Canada. Graphing of the ratios calculated may provide useful information regarding the size of school organizations at which ratios of of personnel in various components are minimal.

Although tendencies regarding the relationship between the size of the central office component(s) and the size of school systems were evident, no definite conclusions were drawn. A study similar to either this one or that of Carter may prove quite useful for theory and practise if it is restricted to an in-depth investigation of the central office components and is carried out for a much larger sample of school systems.

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APPENDIX A

Instruments for Collecting Data



January 30, 1970

Several enlightening studies regarding the administrative structures in 41 school districts in Western Canada and 108 school districts in Alberta have been recently performed by the Department of Educational Administration at the University of Alberta. Prior research of this project has been reported in the October 1968, and January 1970 issues of The Canadian Administrator.

As part of a continuing project, we are requesting your cooperation in an investigation of administrative and supervisory ratios and salaries in school systems located in the seven major metropolitan areas in Western Canada. Would you please complete the enclosed questionnaire which contains two major sections?

SECTION A - (1) the numbers of schools, teachers and pupils, (2) the positions and numbers of administrative and supervisory personnel located in the central office, (3) the positions and numbers of professional, consultative personnel located in the central office, (4) the positions and numbers of support personnel located in the central office, (5) the total gross annual salaries of all personnel located in the central office, (6) the number and honoraria/salaries of school board members, and (7) the operational expenditures for the 1969-70 school year.

SECTION B - (1) the positions and numbers of administrative and supervisory personnel located in schools, (2) the positions and numbers of support personnel located in schools, and (3) the total gross salaries of all non-administrative and non-supervisory personnel located in schools.

We appreciate that the compilation of information regarding salaries in SECTION B may take considerable time. If you feel that this task is too demanding at the moment, would you please complete and return SECTION A and both Columns B and C in PART 1, and PART 2 of SECTION B. You may retain the second copy of SECTION B to complete at a more convenient time, or with your permission one of us could visit your central office to extract the remaining data.

Following established practice, a research report will be forwarded to each participating district. In the report, districts will not be identified by name. A stamped, addressed envelope is enclosed.

SECTION A

NAME OF SCHOOL SYSTEM _____

PART 1. NUMBERS OF SCHOOLS, TEACHERS AND PUPILS IN THE SYSTEM, 1969-70

INSTRUCTIONS: Please fill in the information for your school system in the columns provided. A suggested date for the data is the first date on which schools submit their school census to the central office.

TYPE OF SCHOOL	NUMBER OF SCHOOLS	NUMBER OF TEACHERS*	NUMBER OF PUPILS**
Elementary School			
Junior High/Secondary			
Senior High/Secondary			
Elementary-Junior High/Secondary			
Junior-Senior High/Secondary			
Elem-Junior-Senior High/Secondary			
Other Schools (Please Specify			
TOTALS			

* Include the full-time equivalents for any part-time teachers.

** Do NOT include pupils enrolled in evening or Saturday classes.

PART 3. POSITIONS AND NUMBERS OF PROFESSIONAL, CONSULTATIVE PERSONNEL LOCATED IN THE CENTRAL OFFICE

INSTRUCTIONS: Please state in Column B the number of central office personnel in each position listed in Column A. If other offices exist in your system, please add them to the list.

[illegible]

PART 4. POSITIONS AND NUMBERS OF SUPPORT STAFF LOCATED IN THE CENTRAL OFFICE

INSTRUCTIONS: Please state in Column B the number of central office personnel in each position listed in Column A. If other offices exist in your system, please add them to the list. For each of these positions include full-time equivalents for any part-time personnel. Do not include personnel who manufacture furniture etc.

[illegible]

PART 5. TOTAL ANNUAL SALARIES OF ALL PERSONNEL LOCATED IN THE CENTRAL OFFICE

INSTRUCTIONS: Column A contains a description of all personnel located in the central office. Please provide the information for EITHER Column B AND Column C OR for Column D only.

Column A	Column B	Column C	Column D
DESCRIPTION OF CENTRAL OFFICE PERSONNEL	TOTAL ANNUAL SALARIES FOR ALL IN THIS POSITION FOR THE CALENDAR YEAR 1969	TOTAL ANNUAL SALARIES FOR ALL IN THIS POSITION FOR THE CALENDAR YEAR 1970	TOTAL ANNUAL SALARIES FOR ALL IN THIS POSITION FOR 1969-70 SCHOOL YEAR
Administrative and Supervisory Per- sonnel (All per- sonnel listed on page 2.)			
Consultative Per- sonnel (All per- sonnel listed on page 3.)			
Support Personnel (All personnel listed on page 4.)			

PART 6. NUMBERS AND HONORARIA/SALARIES OF SCHOOL BOARD MEMBERS

INSTRUCTIONS: Please provide the following information:

Total number of school board members _____

Total gross annual honoraria/salaries of all
school board members _____

PART 7. OPERATIONAL EXPENDITURES

Please provide the information for either one of the following two parts:
(Exclude all debt charges and transfers to capital funds)

EITHER

Estimated operational expenditures (per budget)
for the calendar year 1969 _____

AND

Estimated operational expenditures (per budget)
for the calendar year 1970 _____

OR

Estimated operational expenditures for the 1969-70
school year (should your budget be based on the school
year rather than the calendar year) _____

SECTION B

NAME OF SCHOOL SYSTEM _____

PART 1. POSITIONS, NUMBERS, AND SALARIES OF ADMINISTRATIVE AND SUPERVISORY PERSONNEL LOCATED IN SCHOOLS (for the 1969-70 school year)

INSTRUCTIONS:

Column A In this column are listed several administrative and supervisory positions which are commonly located in many school systems. If a difference exists in terminology, you may either choose an appropriate listing or name the position in the "other" section of each category.

Column B State the number of people in each position in your system.

Column C Please provide an estimate of the average percentage of working time allotted to each position for administrative or supervisory purposes only.

Column D State the total gross salary paid to all personnel listed in each administrative or supervisory position listed in Column A.

Column E Place the total administrative allowance paid to all personnel within the respective administrative category. If no such allowance is granted, please leave the space blank.

NOTE: Please do not include as administrative and supervisory positions those of counsellors, librarians, transportation or cafeteria personnel.

Column A	Column B	Column C	Column D	Column E
ADMINISTRATIVE AND SUPERVISORY POSITIONS	TOTAL NUMBER IN SCHOOL SYSTEM	ESTIMATED AVERAGE PERCENTAGE OF TIME SPENT IN ADMIN. AND STAFF SUPERVISION	TOTAL GROSS SALARY OF ALL IN EACH POSITION	TOTAL ADMIN. & SUPERVISORY ALLOWANCE
1. ELEMENTARY SCHOOLS				
Principal				
1st Asst. Principal				
2nd Asst. Principal				
Subject Coordinator				
Other (Please specify)				

PART 1. Continued:

Column A	Column B	Column C	Column D	Column E
ADMINISTRATIVE AND SUPERVISORY POSITIONS	TOTAL NUMBER IN SCHOOL SYSTEM	ESTIMATED AVERAGE PERCENTAGE OF TIME SPENT IN ADMIN. AND STAFF SUPERVISION	TOTAL GROSS SALARY OF ALL IN EACH POSITION	TOTAL ADMIN. & SUPERVISORY ALLOWANCE
2. JUNIOR HIGH/SEC.				
Principal				
1st Assistant Principal				
2nd Assistant Principal				
Subject Coordinator				
Department Head				
Other (Specify)				

3. SENIOR HIGH/SEC.				
Principal				
1st Assistant Principal				
2nd Assistant Principal				
3rd Assistant Principal				
Administrative Assistants				
Department Head				
Assistant Department Head				
Business Manager				
Other (Specify)				

PART 1. Continued:

Column A	Column B	Column C	Column D	Column E
ADMINISTRATIVE AND SUPERVISORY POSITIONS	TOTAL NUMBER IN SCHOOL SYSTEM	ESTIMATED AVERAGE PERCENTAGE OF TIME SPENT IN ADMIN. AND STAFF SUPERVISION	TOTAL GROSS SALARY OF ALL IN EACH POSITION	TOTAL ADMIN. & SUPERVISORY ALLOWANCE
4. ELEM-JUNIOR HIGH/SEC.				
Principal				
1st Assistant Principal				
2nd Assistant Principal				
Department Head				
Subject Coordinator				
Other (Specify)				

5. JUNIOR-SENIOR HIGH/SECONDARY				
Principal				
1st Assistant Principal				
2nd Assistant Principal				
3rd Assistant Principal				
Administrative Assistant				
Business Manager				
Department Head				
Assistant Department Head				
Subject Coordinator				
Other (Specify)				

PART 1. Continued:

Column A	Column B	Column C	Column D	Column E
ADMINISTRATIVE AND SUPERVISORY POSITIONS	TOTAL NUMBER IN SCHOOL SYSTEM	ESTIMATED AVERAGE PERCENTAGE OF TIME SPENT IN ADMIN. AND STAFF SUPERVISION	TOTAL GROSS SALARY OF ALL IN EACH POSITION	TOTAL ADMIN. & SUPERVISORY ALLOWANCE
6. ELEMENTARY-JUNIOR-SENIOR HIGH/SECONDARY				
Principal				
1st Assistant Principal				
2nd Assistant Principal				
3rd Assistant Principal				
Administrative Assistant				
Department Head				
Assistant Department Head				
Subject Coordinator				
Other (Specify)				

7. OTHER SCHOOLS				
Principal				
1st Assistant Principal				
2nd Assistant Principal				
Other (Specify)				

PART 2. POSITIONS AND NUMBERS OF SUPPORT STAFF LOCATED IN SCHOOLS (For the 1969-70 School Year)

INSTRUCTIONS: Please fill in the information for your school system in the columns provided.

NOTE: For each of the following please include full-time equivalents for any part-time employees.

[illegible]

PART 3. TOTAL GROSS ANNUAL SALARIES OF ALL NON-ADMINISTRATIVE AND NON-SUPERVISORY PERSONNEL LOCATED IN SCHOOLS (For the 1969-70 School Year)

INSTRUCTIONS: Column A contains a description of all non-administrative and non-supervisory personnel located in schools. Please provide the information for EITHER Column B AND Column C OR for Column D only.

Column A	Column B	Column C	Column D
DESCRIPTION OF PERSONNEL LOCATED IN SCHOOLS	TOTAL ANNUAL SALARIES FOR ALL IN THIS POSITION FOR THE CALENDAR YEAR 1969	TOTAL ANNUAL SALARIES FOR ALL IN THIS POSITION FOR THE CALENDAR YEAR 1970	TOTAL ANNUAL SALARIES FOR ALL IN THIS POSITION FOR 1969-70 SCHOOL YEAR
Teachers*			
Support Personnel**			

* EXCLUDE all certificated personnel located in the central office and all administrative and supervisory personnel listed in PART 1 of SECTION B.

** INCLUDE all personnel listed in PART 2 of SECTION B.



March 23, 1970

On January 30, a questionnaire was mailed to you regarding an investigation of administrative and supervisory ratios and salaries. To date no reply has been received from your system, but returns, or notifications of cooperation, have so far been received from 20 of 31 districts.

Because this study is intended to provide a realistic analysis of administrative and supervisory ratios and costs in school systems located in the seven major metropolitan areas in Western Canada, the inclusion of your information is essential.

I appreciate that the time required to complete the return is considerable, but the people who have been involved so far in the school systems have expressed a great deal of interest in the type of comparative data which will result. One member of the research team, Mr. Bill Lepatski, will be in British Columbia from April 15 to April 30, and if you are agreeable, I would like him to have the opportunity of discussing the project with you. At that time he may also be able to assist in extracting data and to answer any questions which you may have.

A research report will be forwarded to each district following completion of the analysis.

Thank you for your cooperation,

E.A. Holdaway,
Associate Professor

APPENDIX B

Numbers, Total Gross Salaries, Administrative Allowances, and
Administrative Costs of Administrators in Each Type of
School in Twenty-one Western Canadian School
Systems for the 1969-70 School Year

Table 39

Numbers, Total Gross Salaries, Administrative Allowances, and
Administrative Costs of Elementary School Principals

School system identifier	Number of principals	Average per cent of time spent in admin.	No. of principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost
B11	69	100	69.0	1,206,360	n/a	1,206,360
B12	33	94	30.9	562,410	147,250	537,500
B13	33	82	27.0	515,020	138,030	447,160
B14	35	83	29.1	568,425	142,790	496,070
B15	28	72	20.2	490,073	132,190	389,865
B16	21	95	20.0	334,205	78,050	321,400
B17	13	65	8.5	212,448	51,705	156,190
B18	13	80	10.4	232,390	61,710	198,250
B19	8	100	8.0	129,660	4,460	129,660
B21	36	33	12.0	542,870	122,810	262,690
B22	13	50	6.5	143,610	25,310	84,460
B23	13	50	6.5	165,140	32,490	98,810
M11	55	95	52.3	873,890	154,810	837,930
M12*	21*	80*	16.8*	300,000*	30,000*	246,000*
M13	16	75	12.0	201,255	21,200	156,240
M14	7	100	7.0	104,580	22,580	104,580
M15	6	95	5.7	63,665	15,915	61,280
M16	12	80	9.6	97,825	18,200	81,900
M17	5	100	5.0	74,950	15,000	74,950
M18	3	50	1.5	29,000	1,275	15,140
M19	2	90	1.8	27,650	5,200	25,400

*Projected figures.



Table 40

Numbers, Total Gross Salaries, Administrative Allowances, and Administrative Costs
of Elementary School Administrators

Assistant/vice-principals										Other administrators ^a									
School system identifier	No. of assistant principals	Average per cent of time spent in admin.	No. of assistant principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other admin.	Average per cent of time spent in admin.	No. of other admin.	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other admin.	Average per cent of time spent in admin.	No. of other admin.	Total gross salaries	Total administrative allowances	Total administrative cost	
B11	67	30	20.1	800,780	115,250	320,910	24	50	12.0	246,770	50,070	148,420	24	50	12.0	246,770	50,070	148,420	
B12	19	78	14.8	286,740	42,530	233,010	2	20	.4	26,240	2,030	6,870	2	20	.4	26,240	2,030	6,870	
B13	21	10	2.1	285,480	56,240	79,170	25	5	1.3	255,280	20,570	32,300	25	5	1.3	255,280	20,570	32,300	
B14	26	5	1.3	336,510	56,180	70,200	-	-	-	-	-	-	-	-	-	-	-	-	
B15	19	17	3.2	275,720	47,484	86,280	15	13	2.0	177,192	18,300	38,990	15	13	2.0	177,192	18,300	38,990	
B16	14	5	.7	169,960	26,425	33,600	14	5	.7	135,728	14,650	20,700	14	5	.7	135,728	14,650	20,700	
B17	8	20	1.6	98,217	16,824	33,100	5	10	0.5	47,442	2,922	7,370	5	10	0.5	47,442	2,922	7,370	
B18	11	20	2.2	154,110	23,280	49,450	-	-	-	-	-	-	-	-	-	-	-	-	
B19	7	25	1.8	87,130	13,700	32,060	-	-	-	-	-	-	-	-	-	-	-	-	

^aOther elementary administrators are head teachers and subject coordinators.



Table 40 (continued)

Assistant/vice-principals										Other administrators					
School system identifier	No. of assistant principals	Average per cent of time spent in admin.	No. of assistant principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other admin.	Average per cent of time spent in admin.	No. of other admin. in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other admin.	Average per cent of time spent in admin.	No. of other admin. in full-time equivalents
B21	32	13	4.0	393,900	50,670	93,770	7	0	0.0	73,760	1,990	1,990	7	0	0.0
B22	4	20	.8	39,810	5,830	12,630	-	-	-	-	-	-	-	-	-
B23	7	0	0.0	76,700	7,400	7,400	1	0	0.0	6,530	260	260	1	0	0.0
M11	8	60	4.8	108,380	10,460	69,210	4	0	0.0	50,500	1,260	1,260	4	0	0.0
M12	14	30	4.2	180,000	15,000	64,500	-	-	-	-	-	-	-	-	-
M13	5	30	1.5	57,833	4,000	20,150	-	-	-	-	-	-	-	-	-
M14	6	50	3.0	69,200	6,900	38,050	-	-	-	-	-	-	-	-	-
M15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M16	2	50	1.0	23,475	800	12,140	-	-	-	-	-	-	-	-	-
M17	-	-	-	-	-	-	2.5	100	2.5	21,000	n/a	21,000	-	-	-
M18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M19	2	20	.4	13,900	1,000	3,580	-	-	-	-	-	-	-	-	-

Table 41

Numbers, Total Gross Salaries, Administrative Allowances, and Administrative Costs of
Junior High School Administrators

School system identifier	Principals							Assistant/vice-principals						
	No. of principals	Average per cent of time in admin.	No. of principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost		No. of assistant principals	Average per cent of time in admin.	No. of assistant principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	
B11	-	-	-	-	-	-		-	-	-	-	-	-	
B12	7	100	7.0	135,890	50,200	135,890		7	100	7.0	118,140	31,900	118,140	
B13	9	100	9.0	146,130	55,000	146,130		9	65	5.9	134,000	31,090	97,970	
B14	7	100	7.0	131,510	41,120	131,510		7	100	7.0	114,230	24,490	114,230	
B15	3	92	2.7	60,398	20,466	57,200		4	85	3.4	63,444	16,087	56,190	
B16	5	100	5.0	94,596	29,000	94,600		5	75	3.8	42,953	16,980	59,930	
B17	2	70	1.4	38,679	11,535	30,540		2	55	1.1	30,549	6,921	19,920	
	-	-	-	-	-	-		-	-	-	-	-	-	
	-	-	-	-	-	-		-	-	-	-	-	-	

Table 41 (continued)

Principals										Assistant/vice-principals									
School system identifier	No. of principals	Average per cent of time in admin.	No. of principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of assistant principals	Average per cent of time in admin.	No. of assistant principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	School system identifier						
B21	7	95	6.7	124,920	38,760	120,690	7	56	3.9	103,060	18,130	65,270	B21						
B22	2	70	1.4	36,650	11,470	25,970	2	43	.9	27,030	5,020	14,375	B22						
B23	3	60	1.8	50,740	14,050	36,060	3	40	1.2	38,250	7,020	19,520	B23						
M11	6	100	6.0	104,500	21,900	104,500	6	85	5.1	85,450	9,140	74,130	M11						
M12	7	80	5.6	110,000	24,500	92,900	6	40	2.4	84,000	9,000	39,000	M12						
M13	4	100	4.0	59,825	10,000	59,825	4	50	2.0	54,240	3,200	28,720	M13						
M14	2	100	2.0	32,550	8,550	32,550	2	100	2.0	24,825	4,278	24,825	M14						
M15	-	-	-	-	-	-	-	-	-	-	-	-	M15						
M16	2	100	2.0	31,050	6,000	31,050	2	75	1.5	27,425	3,000	21,320	M16						
M17	-	-	-	-	-	-	-	-	-	-	-	-	M17						
M18	-	-	-	-	-	-	-	-	-	-	-	-	M18						
M19	-	-	-	-	-	-	-	-	-	-	-	-	M19						

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Table 41 (continued)

Department heads										Other administrators ^a									
School system identifier	No. of department heads	Average per cent of time in admin.	No. of department heads in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other admin.	Average per cent of time spent in admin.	No. of other admin. in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other admin.	Average per cent of time spent in admin.	No. of other admin. in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	
B11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12	48	15	7.2	606,530	37,230	91,000	20	0	0.0	261,000	10,730	10,730	20	0	0.0	261,000	10,730	10,730	10,730
B13	27	15	4.0	295,570	18,370	59,950	-	-	-	-	-	-	-	-	-	-	-	-	-
B14	29	5	1.5	308,180	24,790	38,860	-	-	-	-	-	-	-	-	-	-	-	-	-
B15	21	8	1.7	258,834	18,000	37,990	3	8	.2	39,151	2,700	2,700	3	8	.2	39,151	2,700	2,700	5,690
B16	50	0	0.0	625,000	28,550	28,550	-	-	-	-	-	-	-	-	-	-	-	-	-
B17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

^aOther junior high school administrators are subject consultants, administrative assistants, and subject coordinators.





Table 42

Numbers, Total Gross Salaries, Administrative Allowances, and
Administrative Costs of Senior High School Principals

School system identifier	Number of principals	Average per cent of time spent in admin.	Number of principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost
B11	-	-	-	-	-	-
B12	3	100	3.0	61,586	24,960	61,586
B13	5	100	5.0	93,390	35,000	93,390
B14	1	100	1.0	21,400	8,260	21,400
B15	2	87	1.7	41,545	15,057	38,050
B16	2	100	2.0	37,920	12,650	37,920
B17	-	-	-	-	-	-
B18	-	-	-	-	-	-
B19	-	-	-	-	-	-
B21	5	97	3.6	91,830	28,550	90,060
B22	1	43	.4	17,560	4,980	12,870
B23	1	71	.7	17,900	6,170	14,502
M11	4	100	4.0	74,790	26,800	74,790
M12	5	100	5.0	92,500	32,000	92,500
M13	2	100	2.0	36,760	6,000	36,760
M14	1	100	1.0	16,100	4,600	16,600
M15	2	100	2.0	33,605	9,930	33,605
M16	2	100	2.0	33,550	7,600	33,550
M17	1	100	1.0	17,100	4,125	17,100
M18	1	50	.5	14,990	3,440	9,220
M19	1	100	1.0	16,100	3,800	16,100



Table 43

Numbers, Total Gross Salaries, Administrative Allowances, and Administrative Costs of
Senior High School Administrators

1st assistant/vice-principals														Other assistant/vice-principals													
School system identifier	No. of 1st assistant principals	Average per cent of time spent in admin.	No. of 1st assistant principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other assistant principals	Average per cent of time spent in admin.	No. of other assistant principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	School system identifier	No. of 1st assistant principals	Average per cent of time spent in admin.	No. of other assistant principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost								
B11	-	-	-	-	-	-	-	-	-	-	-	-	B11	-	-	-	-	-	-	-							
B12	3	100	3.0	53,420	16,560	53,420	-	-	-	-	-	-	B12	3	75	-	-	-	-	-							
B13	5	75	3.8	77,790	17,880	64,620	-	-	-	-	-	-	B13	5	100	-	-	-	-	-							
B14	2	100	2.0	34,900	9,940	34,900	-	-	-	-	-	-	B14	2	74	-	-	-	-	-							
B15	2	74	1.5	34,274	9,034	27,790	1	63	.6	16,914	4,679	12,330	B15	2	92	-	-	-	-	-							
B16	2	92	1.8	34,210	7,590	32,800	-	-	-	-	-	-	B16	2	-	-	-	-	-	-							
B17	-	-	-	-	-	-	-	-	-	-	-	-	B17	-	-	-	-	-	-	-							
B18	-	-	-	-	-	-	-	-	-	-	-	-	B18	-	-	-	-	-	-	-							
B19	-	-	-	-	-	-	-	-	-	-	-	-	B19	-	-	-	-	-	-	-							



Table 43 (continued)

1st assistant/vice-principals										Other assistant/vice-principals									
School system identifier	No. of 1st assistant principals	Average per cent of time spent in admin.	No. of 1st assistant principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other assistant principals	Average per cent of time spent in admin.	No. of other assistant principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other assistant principals	Average per cent of time spent in admin.	No. of other assistant principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	
B21	5	62	3.1	77,450	14,360	53,730	-	-	-	-	-	-	-	-	-	-	-	-	
B22	1	57	.6	15,070	2,490	9,660	-	-	-	-	-	-	-	-	-	-	-	-	
B23	1	43	.4	15,660	3,090	8,490	-	-	-	-	-	-	-	-	-	-	-	-	
M11	4	100	4.0	64,640	4,000	64,640	3	87	2.6	41,390	2,100	36,310	3	87	2.6	41,390	2,100	36,310	
M12	5	90	4.5	80,000	17,500	73,750	2	50	1.0	30,000	5,000	17,500	2	50	1.0	30,000	5,000	17,500	
M13	2	100	2.0	30,480	1,600	30,480	2	50	1.0	29,340	1,600	15,470	2	50	1.0	29,340	1,600	15,470	
M14	1	100	1.0	14,300	2,300	14,300	-	-	-	-	-	-	-	-	-	-	-	-	
M15	2	100	2.0	29,625	6,725	29,625	-	-	-	-	-	-	-	-	-	-	-	-	
M16	2	75	1.5	29,600	4,300	23,275	1	50	.5	12,075	800	6,440	1	50	.5	12,075	800	6,440	
M17	1	100	1.0	15,300	3,200	15,300	-	-	-	-	-	-	-	-	-	-	-	-	
M18	1	50	.5	12,697	1,147	6,920	-	-	-	-	-	-	-	-	-	-	-	-	
M19	1	70	.7	12,790	1,200	9,310	1	50	.5	10,260	1,200	5,730	1	50	.5	10,260	1,200	5,730	



Table 43 (continued)

Department heads										Other administrators ^a									
School system identifier	No. of department heads	Average per cent of time in admin.	No. of department heads in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other admin.	Average per cent of time spent in admin.	No. of other admin. in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	School system identifier	No. of department heads	Average per cent of time in admin.	No. of other admin. in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost
B11	-	-	-	-	-	-	-	-	-	-	-	-	B11	-	-	-	-	-	-
B12	33	15	5.0	420,200	33,460	91,500	6	10	.6	75,820	1,870	9,200	B12	33	15	5.0	420,200	33,460	91,500
B13	9	15	1.4	108,500	6,124	21,480	-	-	-	-	-	-	B13	9	15	1.4	108,500	6,124	21,480
B14	7	5	.4	73,870	5,930	9,330	2	100	2.0	30,230	6,610	30,230	B14	7	5	.4	73,870	5,930	9,330
B15	18	16	2.8	231,739	15,600	49,750	3	23	.7	41,884	3,600	11,790	B15	18	16	2.8	231,739	15,600	49,750
B16	21	0	0.0	262,500	13,325	13,325	-	-	-	-	-	-	B16	21	0	0.0	262,500	13,325	13,325
B17	-	-	-	-	-	-	-	-	-	-	-	-	B17	-	-	-	-	-	-
B18	-	-	-	-	-	-	-	-	-	-	-	-	B18	-	-	-	-	-	-
B19	-	-	-	-	-	-	-	-	-	-	-	-	B19	-	-	-	-	-	-

^aOther senior high school administrators are business managers, administrative assistants, and subject coordinators.



Table 43 (continued)

Department heads										Other administrators									
School system identifier	No. of department heads	Average per cent of time spent in admin.	No. of department heads in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of department heads	Average per cent of time spent in admin.	No. of other admin.	No. of other admin. time spent in admin.	No. of other admin. in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of department heads	Average per cent of time spent in admin.	No. of other admin.	No. of other admin. time spent in admin.	No. of other admin. in full-time equivalents
B21	36	7	2.6	444,300	23,500	53,810			-	-	-	-	-	-			-	-	-
B22	-	-	-	-	-	-			-	-	-	-	-	-			-	-	-
B23	-	-	-	-	-	-			-	-	-	-	-	-			-	-	-
M11	97	7	6.8	1,157,000	81,170	156,460			-	-	-	-	-	-			-	-	-
M12	-	-	-	-	-	-			-	-	-	-	-	-			-	-	-
M13	18	20	3.6	214,060	9,075	50,070			-	-	-	-	-	-			-	-	-
M14	-	-	-	-	-	-			-	-	-	-	-	-			-	-	-
M15	9	25	2.3	106,165	4,950	30,250			-	-	-	-	-	-			-	-	-
M16	13	8	1.0	152,600	3,900	15,800			-	-	-	-	-	-			-	-	-
M17	9	6	.5	93,000	4,500	9,810			-	-	-	-	-	-			-	-	-
M18	4	7	.3	39,050	1,200	3,860			1	50	.5	13,530	3,130	8,340			-	-	-
M19	-	-	-	-	-	-			-	-	-	-	-	-			-	-	-



Table 44

Numbers, Total Gross Salaries, Administrative Allowances and Administrative Costs of
Elementary-Junior High School Administrators

School system identifier	Principals						Assistant/vice-principals					
	No. of principals	Average per cent of time spent in admin.	No. of principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of assistant principals	Average per cent of time spent in admin.	No. of assistant principals in full- time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost
B11	1		1	1		1	1	1	1	1		1
B12	1		1	1		1	1	1	1	1		1
B13	1		1	1		1	1	1	1	1		1
B14	1		1	1		1	1	1	1	1		1
B15	1		1	1		1	1	1	1	1		1
B16	1		1	1		1	1	1	1	1		1
B17	1		1	1		1	1	1	1	1		1
B18	1		1	1		1	1	1	1	1		1
B19	1		1	1		1	1	1	1	1		1



Table 44 (continued)

School system identifier	Principals						Assistant/vice-principals					
	No. of principals	Average per cent of time spent in admin.	No. of principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of assistant principals	Average per cent of time spent in admin.	No. of assistant principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost
B21	1	60	.6	17,080	4,500	12,040	1	49	.5	14,830	2,250	8,350
B22	1	21	.2	17,200	4,620	7,270	1	10	.1	14,890	2,310	3,320
B23	-	-	-	-	-	-	-	-	-	-	-	-
M11	6	100	6.0	104,500	21,900	104,500	6	90	5.4	87,700	12,140	10,440
M12	2	100	2.0	32,000	7,000	32,000	3	40	1.3	41,500	4,000	15,500
M13	2	100	2.0	30,580	3,500	30,580	1	40	.4	13,450	800	5,860
M14	3	100	3.0	40,200	9,380	40,200	3	50	1.5	20,800	2,450	11,625
M15	5	100	5.0	67,935	20,855	67,935	5	90	4.5	63,850	11,915	58,660
M16	1	100	1.0	12,400	1,800	12,400	1	75	.8	12,000	400	9,100
M17	3	100	3.0	43,450	6,450	43,450	3	50	1.5	36,550	1,500	19,020
M18	4	50	2.0	56,980	11,970	34,480	1	50	.5	11,700	800	6,250
M19	2	100	2.0	28,250	5,800	28,250	2	60	1.2	18,480	2,100	11,930

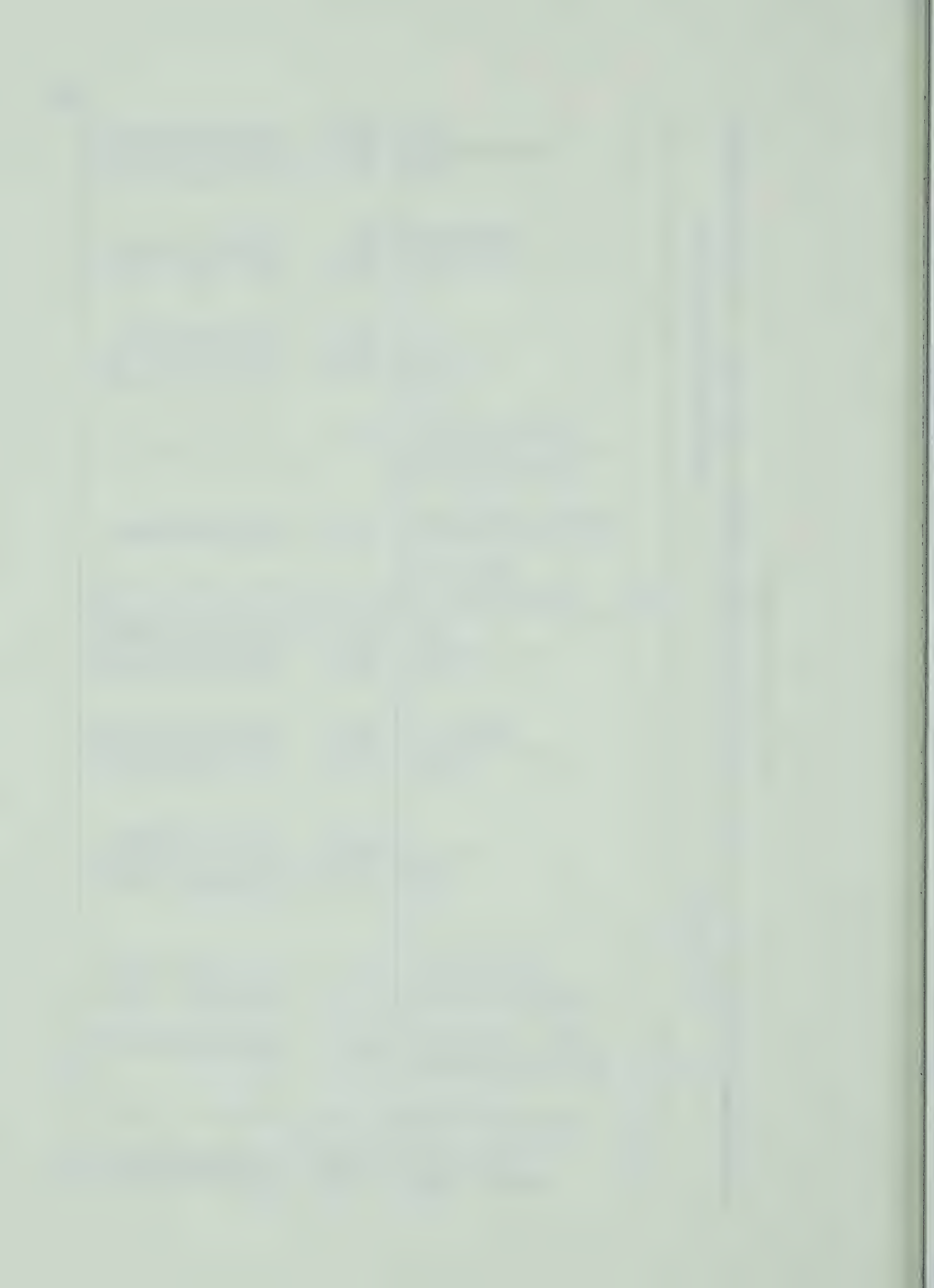


Table 44 (continued)

School system identifier	Department heads							Other administrators ^a						
	No. of department heads	Average per cent of time spent in admin.	No. of department heads in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost		No. of other admin.	Average per cent of time spent in admin.	No. of other admin. in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	
B11	1	1	1	1	1	1		1	1	1	1	1	1	1
B12	1	1	1	1	1	1		1	1	1	1	1	1	1
B13	1	1	1	1	1	1		1	1	1	1	1	1	1
B14	1	1	1	1	1	1		1	1	1	1	1	1	1
B15	1	1	1	1	1	1		1	1	1	1	1	1	1
B16	1	1	1	1	1	1		1	1	1	1	1	1	1
B17	1	1	1	1	1	1		1	1	1	1	1	1	1
B18	1	1	1	1	1	1		1	1	1	1	1	1	1
B19	1	1	1	1	1	1		1	1	1	1	1	1	1

^aOther elementary-junior high school administrators are principal's assistants and subject coordinators.

Table 44 (continued)

School system identifier	Department heads						Other administrators					
	No. of department heads	Average per cent of time spent in admin.	No. of department heads in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other admin.	Average per cent of time spent in admin.	No. of other admin. in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost
B21	-	-	-	-	-	-	-	-	-	-	-	-
B22	-	-	-	-	-	-	-	-	-	-	-	-
B23	-	-	-	-	-	-	-	-	-	-	-	-
M11	12	5	.6	132,640	4,520	10,920	-	-	-	-	-	-
M12	-	-	-	-	-	-	-	-	-	-	-	-
M13	-	-	-	-	-	-	-	-	-	-	-	-
M14	-	-	-	-	-	-	-	-	-	-	-	-
M15	4	25	1.0	42,930	1,780	12,070	-	-	-	-	-	-
M16	-	-	-	-	-	-	-	-	-	-	-	-
M17	-	-	-	-	-	-	-	-	-	-	-	-
M18	-	-	-	-	-	-	-	-	-	-	-	-
M19	-	-	-	-	-	-	-	-	-	-	-	-

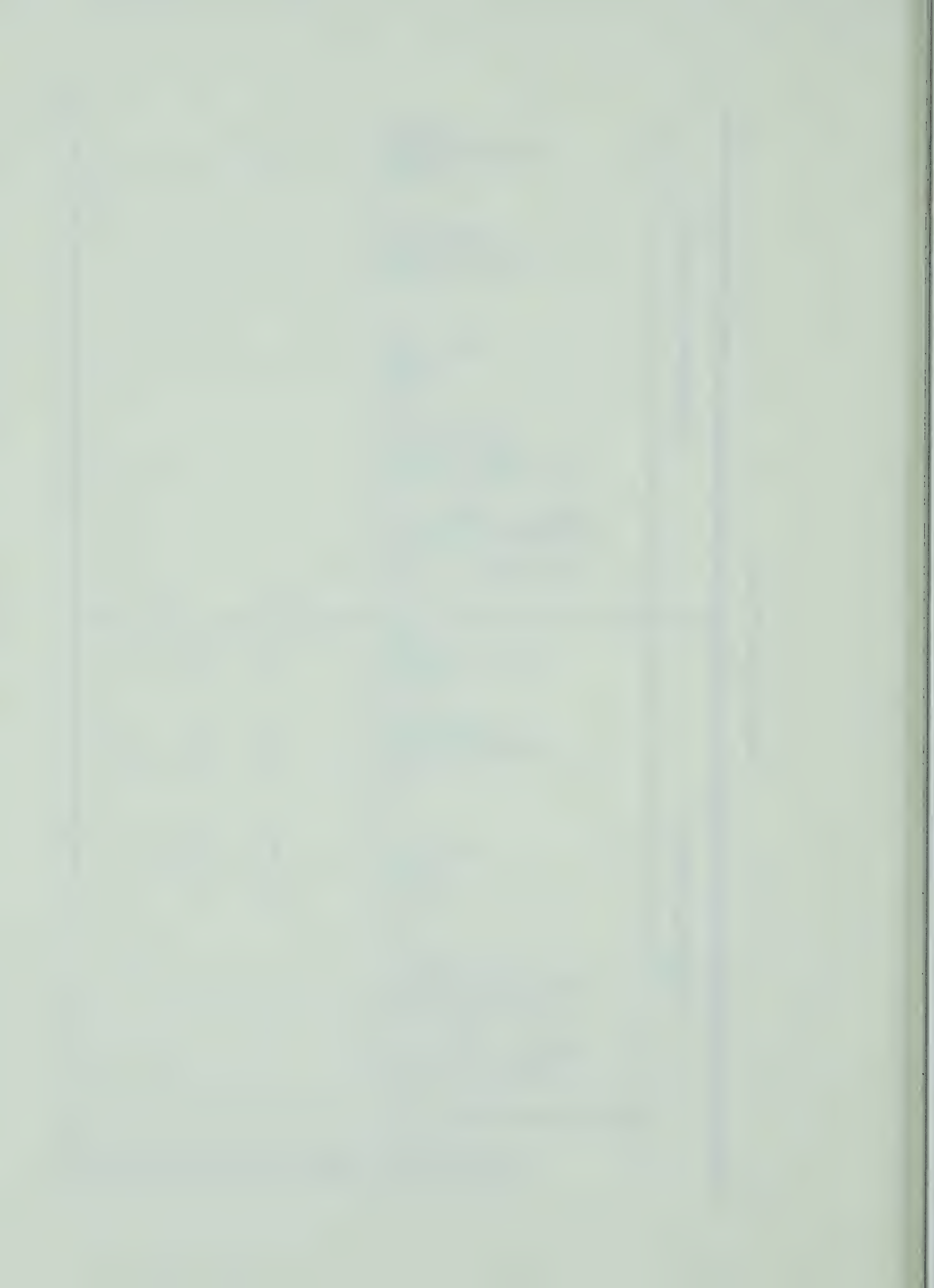


Table 45

Numbers, Total Gross Salaries, Administrative Allowances, and
Administrative Costs of Junior-Senior High School Principals

School system identifier	No. of principals	Average per cent of time spent in admin.	Number of principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost
B11	18	80	14.4	359,640	n/a	287,710
B12	1	100	1.0	19,720	7,450	19,720
B13	-	-	-	-	-	-
B14	1	100	1.0	20,120	7,190	20,120
B15	4	88	3.5	81,867	29,939	75,380
B16	-	-	-	-	-	-
B17	2	100	2.0	42,492	15,607	42,490
B18	3	95	2.9	64,670	22,400	62,420
B19	1	100	1.0	21,932	7,850	21,932
B21	1	100	1.0	18,280	5,700	18,280
B22	1	53	.5	17,010	4,440	11,000
B23	-	-	-	-	-	-
M11	7	100	7.0	135,910	39,000	135,910
M12	-	-	-	-	-	-
M13	-	-	-	-	-	-
M14	1	100	1.0	17,450	4,600	17,450
M15	-	-	-	-	-	-
M16	-	-	-	-	-	-
M17	1	100	1.0	16,200	3,400	16,200
M18	-	-	-	-	-	-
M19	-	-	-	-	-	-

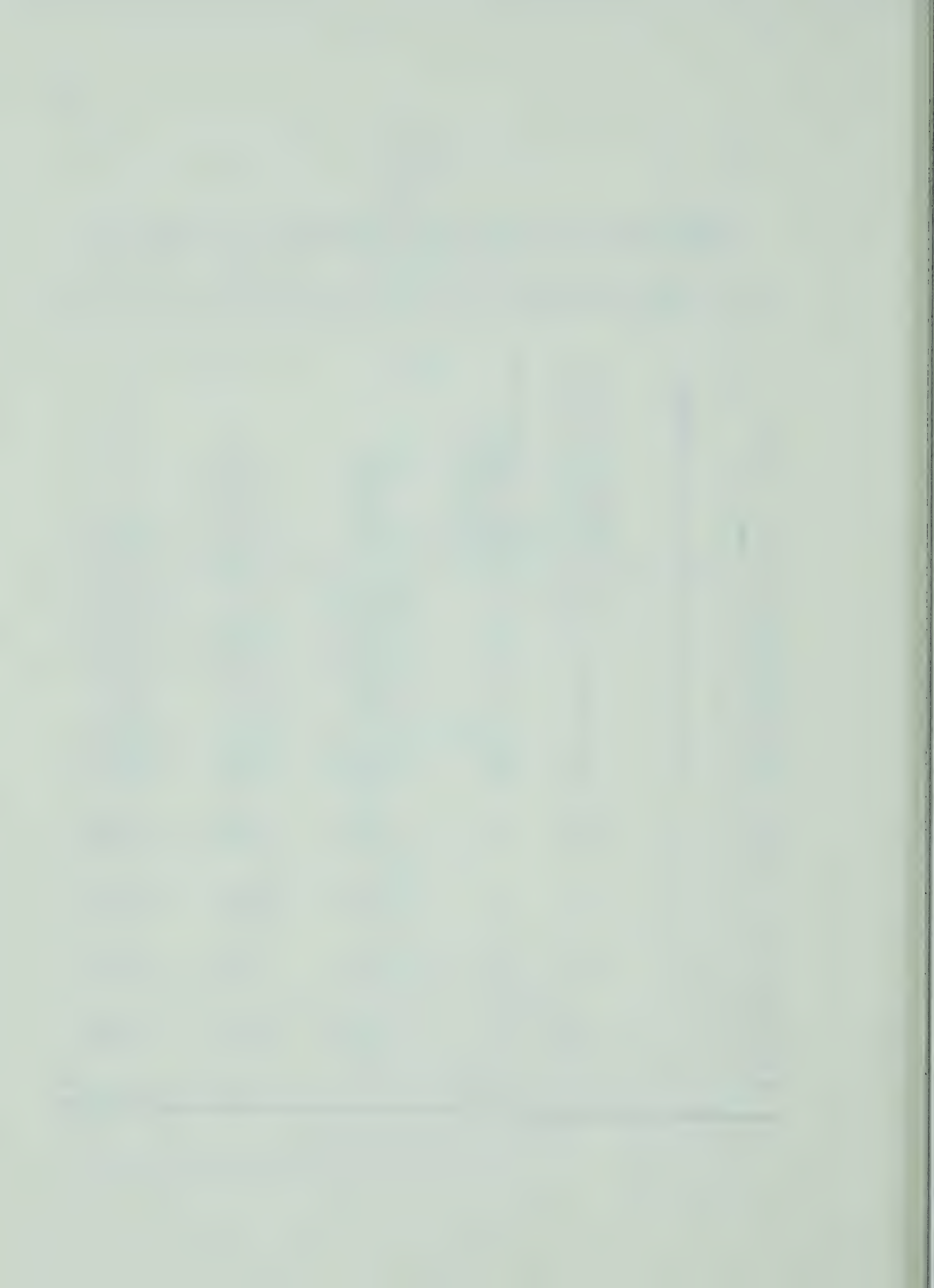


Table 46

Numbers, Total Gross, Salaries, Administrative Allowances, and Administrative Costs of
Junior-Senior High School Administrators

1st assistant/vice-principals										Other assistant/vice-principals									
School system identifier	No. of 1st assistant principals	Average per cent of time spent in admin.	No. of 1st assistant principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other assistant principals	Average per cent of time spent in admin.	No. of other assistant principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost							
B11	18	80	14.4	206,730	n/a	245,380	-	-	-	-	-	-							
B12	1	100	1.0	17,400	5,100	17,400	-	-	-	-	-	-							
B13	-	-	-	-	-	-	-	-	-	-	-	-							
B14	1	90	.9	17,010	4,080	15,720	-	-	-	-	-	-							
B15	4	69	2.8	71,809	19,269	55,390	1	75	.8	18,864	4,656	13,812							
B16	-	-	-	-	-	-	-	-	-	-	-	-							
B17	2	70	1.4	34,949	9,201	27,230	1	70	.7	11,876	4,804	9,750							
B18	4	73	2.9	74,750	19,270	59,500	3	56	1.7	49,150	10,460	32,230							
B19	1	100	1.0	18,046	4,800	18,046	1	100	1.0	18,046	4,800	18,046							

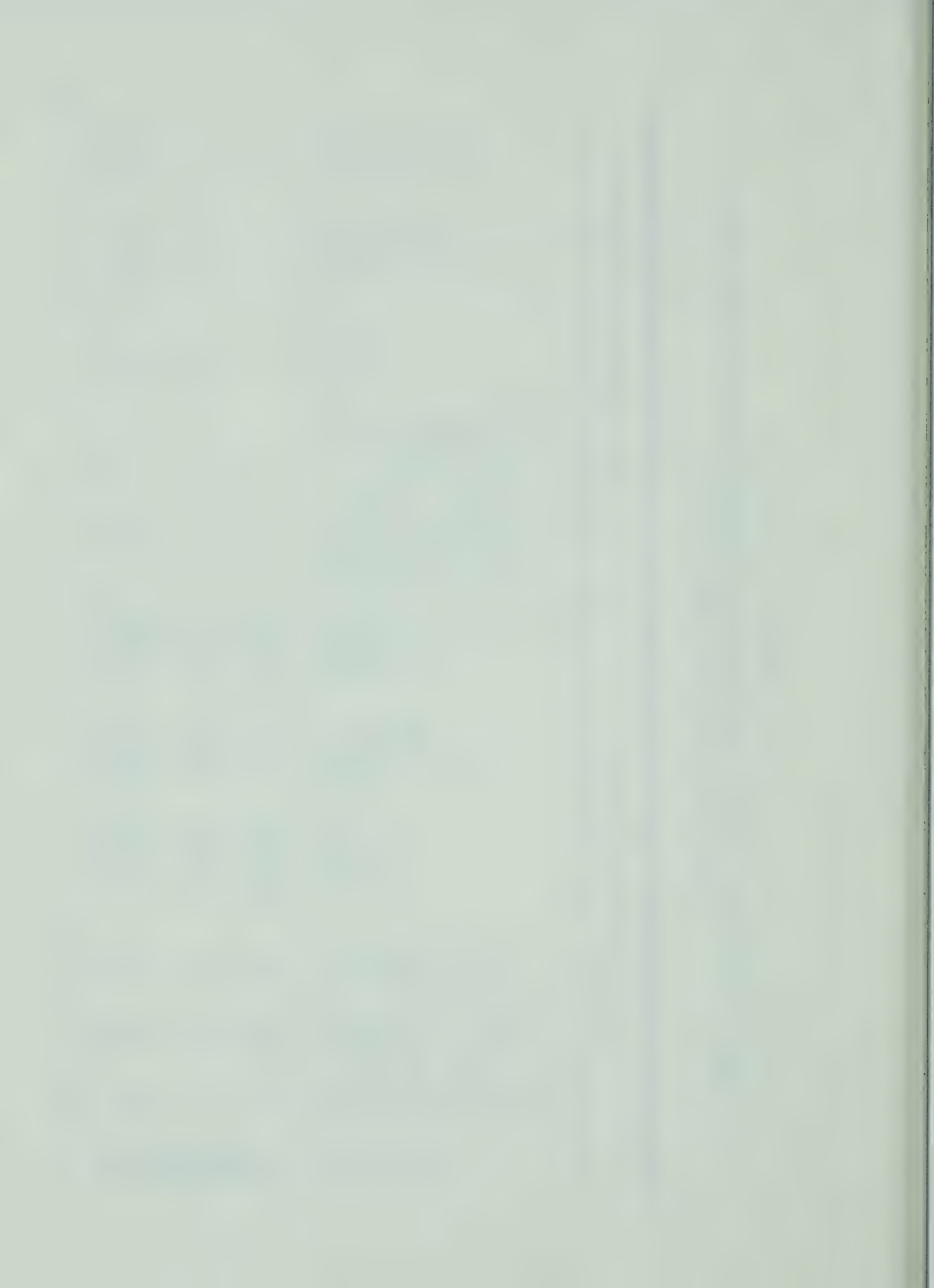


Table 46 (continued)

1st assistant/vice-principals										Other assistant/vice-principals									
School system identifier	No. of 1st assistant principals	Average per cent of time spent in admin.	No. of 1st assistant principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other assistant principals	Average per cent of time spent in admin.	No. of other assistant principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other assistant principals	Average per cent of time spent in admin.	No. of other assistant principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	
B21	1	56	.6	15,620	2,850	10,000	-	-	-	-	-	-	-	-	-	-	-	-	-
B22	1	50	.5	14,030	2,490	8,260	-	-	-	-	-	-	-	-	-	-	-	-	-
B23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M11	7	100	7.0	118,650	22,500	118,650	8	100	8.0	128,130	22,000	128,130	8	100	8.0	128,130	22,000	128,130	
M12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M14	1	100	1.0	13,750	2,300	13,750	-	-	-	-	-	-	-	-	-	-	-	-	-
M15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M17	1	100	1.0	14,400	1,700	14,400	-	-	-	-	-	-	-	-	-	-	-	-	-
M18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 46 (continued)

Department heads										Other administrators ^a									
School system identifier	No. of department heads	Average per cent of time spent in admin.	No. of department heads in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other admin.	Average per cent of time spent in admin.	No. of other admin.	Total gross salaries	Total administrative allowances	Total administrative cost	School system identifier						
B11	259	15	37.2	3,083,300	168,240	590,230	19	8.5	16.1	300,700	n/a	254,550	B11						
B12	10	15	1.5	126,360	7,760	25,560	-	-	-	-	-	-	B12						
B13	-	-	-	-	-	-	-	-	-	-	-	-	B13						
B14	8	5	.4	84,560	6,800	10,700	-	-	-	-	-	-	B14						
B15	30	9	2.6	397,898	29,550	61,970	4	8.0	.3	57,346	3,800	7,820	B15						
B16	-	-	-	-	-	-	-	-	-	-	-	-	B16						
B17	13	5	.7	158,014	10,586	17,960	1	42.0	.4	14,374	2,198	7,310	B17						
B18	28	10	2.8	393,300	27,490	64,070	3	100.0	3.0	18,626	n/a	18,626	B18						
B19	13	15	2.0	198,980	12,640	42,480	-	-	-	-	-	-	B19						

^aOther junior-senior high school administrators are business managers and administrative assistants.

Table 46 (continued)

Department heads										Other administrators									
School system identifier	No. of department heads	Average per cent of time spent in admin.	No. of department heads in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other admin.	Average per cent of time spent in admin.	No. of other admin. in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	School system identifier						
B21	5	8	.2	55,700	2,940	7,210							B21						
B22	-	-	-	-	-	-							B22						
B23	-	-	-	-	-	-							B23						
M11	-	-	-	-	-	-							M11						
M12	-	-	-	-	-	-							M12						
M13	-	-	-	-	-	-							M13						
M14	-	-	-	-	-	-							M14						
M15	-	-	-	-	-	-							M15						
M16	-	-	-	-	-	-							M16						
M17	3	6	.2	31,000	1,500	3,270							M17						
M18	-	-	-	-	-	-							M18						
M19	-	-	-	-	-	-							M19						



Table 47

Numbers, Total Gross Salaries, Administrative Allowances, and Administrative Costs of Administrators in Special Schools^a

School system identifier	Principals						Other administrators ^b					
	No. of principals	Average per cent of time spent in admin.	No. of principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other admin.	Average per cent of time spent in admin.	No. of other admin. in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost
B11	-	-	-	-	-	-	-	-	-	-	-	-
B12	-	-	-	-	-	-	-	-	-	-	-	-
B13	-	-	-	-	-	-	-	-	-	-	-	-
B14	1	100	1.0	11,030	3,790	11,030	-	-	-	-	-	-
B15	-	-	-	-	-	-	-	-	-	-	-	-
B16	-	-	-	-	-	-	-	-	-	-	-	-
B17	-	-	-	-	-	-	-	-	-	-	-	-
B18	-	-	-	-	-	-	-	-	-	-	-	-
B19	-	-	-	-	-	-	-	-	-	-	-	-

^aSpecial schools are such schools as School for the Retarded, School for the Deaf, and School for Physically Handicapped.

^bOther administrators in special schools are assistant principals and coordinators.

Table 47 (continued)

Principals										Other administrators									
School system identifier	No. of principals	Average per cent of time spent in admin.	No. of principals in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost	No. of other admin.	Average per cent of time spent in admin.	No. of other admin. in full-time equivalents	Total gross salaries	Total administrative allowances	Total administrative cost							
B21	3	73	2.2	43,700	11,590	35,030	7	14	1.4	80,340	5,250	11,040							
B22	1	0	0.0	8,910	970	970	-	-	-	-	-	-							
B23	-	-	-	-	-	-	-	-	-	-	-	-							
M11	-	-	-	-	-	-	-	-	-	-	-	-							
M12	-	-	-	-	-	-	-	-	-	-	-	-							
M13	1	100	1.0	17,350	5,300	17,350	-	-	-	-	-	-							
M14	-	-	-	-	-	-	-	-	-	-	-	-							
M15	-	-	-	-	-	-	-	-	-	-	-	-							
M16	-	-	-	-	-	-	-	-	-	-	-	-							
M17	-	-	-	-	-	-	-	-	-	-	-	-							
M18	-	-	-	-	-	-	-	-	-	-	-	-							
M19	-	-	-	-	-	-	-	-	-	-	-	-							

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